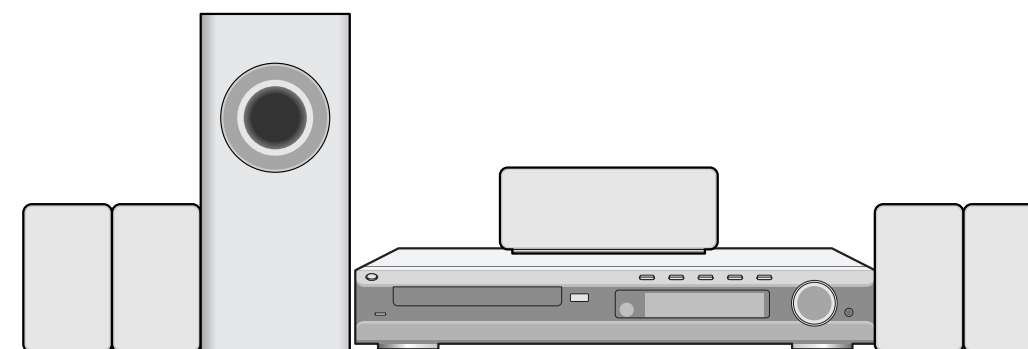




SERVICE MANUAL
MODEL: LH-T6540A/D/X LHS-T66540C, LHS-T6540W, LHS-T6540T



DVD/CD RECEIVER SERVICE MANUAL



MODEL: LH-T6440A/D/X
LHS-T6440C, LHS-T6440W, LHS-T6440T

[CONTENTS]

○ SECTION 1.GENERAL

- SERVICING PRECAUTIONS 1-2
- ESD PRECAUTIONS 1-4
- SPECIFICATIONS 1-5
- AUDIO PART ELECTRICAL TROUBLESHOOTING GUIDE 1-6

○ SECTION 2. AUDIO PART

- ELECTRICAL TROUBLESHOOTING GUIDE 2-1
- BLOCK DIAGRAM 2-5
- SCHEMATIC DIAGRAMS 2-7
- WIRING DIAGRAMS 2-21
- PRINTED CIRCUIT DIAGRAMS 2-23

○ SECTION 3.DVD PART

- DVD PART ELECTRICAL TROUBLESHOOTING GUIDE 3-1
- DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING 3-8
- DVD PART SCHEMATIC DIAGRAMS 3-21
- VOLTAGE SHEET (IC & TR) 3-25

○ SECTION 4. EXPLODED VIEWS 4-1

○ SECTION 5. SPEAKER PART 5-1

○ SECTION 6. REPLACEMENT PARTS LIST 6-1

SECTION 1. GENERAL

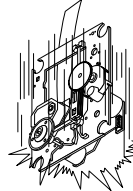
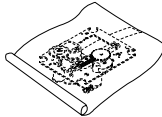
❑ SERVICING PRECAUTIONS

NOTES REGARDING HANDLING OF THE PICK-UP

1. Notes for transport and storage

- 1) The pick-up should always be left in its conductive bag until immediately prior to use.
- 2) The pick-up should never be subjected to external pressure or impact.

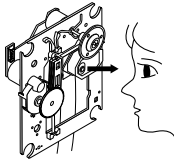
Storage in conductive bag



Drop impact

2. Repair notes

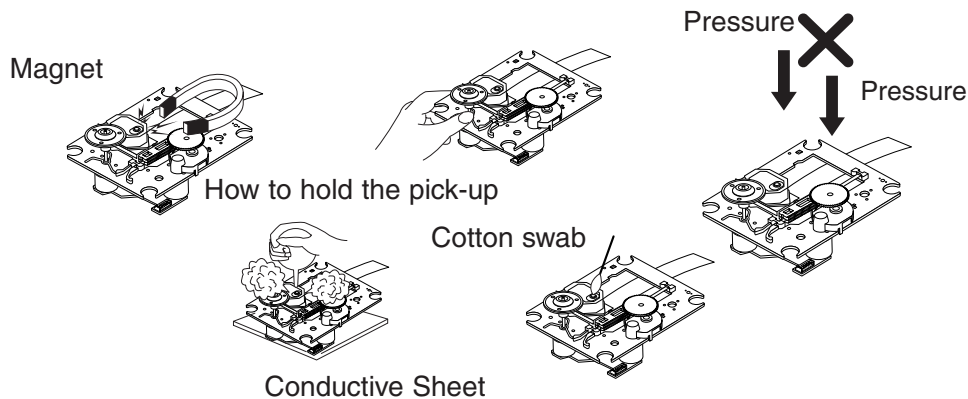
- 1) The pick-up incorporates a strong magnet, and so should never be brought close to magnetic materials.
- 2) The pick-up should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed-circuit board.
- 3) Each and every pick-up is already individually adjusted to a high degree of precision, and for that reason the adjustment point and installation screws should absolutely never be touched.
- 4) Laser beams may damage the eyes!
Absolutely never permit laser beams to enter the eyes!
Also NEVER switch ON the power to the laser output part (lens, etc.) of the pick-up if it is damaged.



NEVER look directly at the laser beam, and don't let contact fingers or other exposed skin.

5) Cleaning the lens surface

If there is dust on the lens surface, the dust should be cleaned away by using an air bush (such as used for camera lens). The lens is held by a delicate spring. When cleaning the lens surface, therefore, a cotton swab should be used, taking care not to distort this.



6) Never attempt to disassemble the pick-up.

Spring by excess pressure. If the lens is extremely dirty, apply isopropyl alcohol to the cotton swab. (Do not use any other liquid cleaners, because they will damage the lens.) Take care not to use too much of this alcohol on the swab, and do not allow the alcohol to get inside the pick-up.

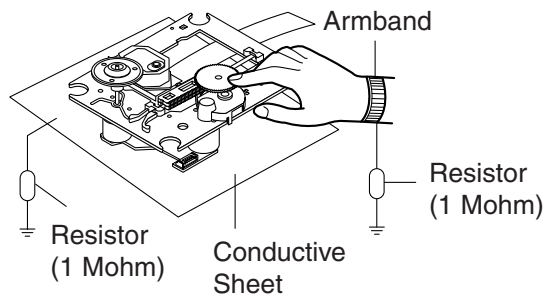
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

1. Preparations

- 1) Compact disc players incorporate a great many ICs as well as the pick-up (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
- 2) The pick-up is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature or humidity is high, where strong magnetism is present, or where there is excessive dust.

2. Notes for repair

- 1) Before replacing a component part, first disconnect the power supply lead wire from the unit
- 2) All equipment, measuring instruments and tools must be grounded.
- 3) The workbench should be covered with a conductive sheet and grounded.
When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
- 4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
- 5) Workers should be grounded by an armband (1M Ω)
- 6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
- 7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)



Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ESD devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

8. Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

CAUTION. GRAPHIC SYMBOLS

	THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SPECIFICATIONS

[General]	Power supply		Refer to main label (labeled at the bottom cover)		
	Power consumption		Refer to main label (labeled at the bottom cover)		
	Mass		4.6 kg		
	External dimensions (W x H x D)		430 x 55 x 350mm		
	Operating conditions		Temperature: 5°C to 35°C, Operation status: Horizontal		
	Operating humidity		5% to 85%		
[CD/DVD]	Laser		Semiconductor laser, wavelength 650 nm		
	Signal system		PAL 625/50, NTSC 525/60		
	Frequency response (audio)		150 Hz to 18 kHz		
	Signal-to-noise ratio (audio)		More than 70 dB (1 kHz, NOP, 20 kHz LPF/A-Filter)		
	Dynamic range (audio)		More than 70 dB		
	Harmonic distortion (audio)		0.5 % (1 kHz, at 12W position) (20 kHz LPF/A-Filter)		
[Video]	Video input		1.0 V (p-p), 75Ω , negative sync., RCA jack x 2/SCART(TO TV)		
	Video output		1.0 V (p-p), 75Ω , negative sync., RCA jack x 1/SCART(TO TV)		
	S-video output		(Y) 1.0 V (p-p), 75Ω , negative sync., Mini DIN 4-pin x 1 (C) 0.3 V (p-p), 75Ω		
[Tuner]	[FM]	Tuning Range	87.5 - 108.0 MHz		
		Intermediate Frequency	10.7 MHz		
		Signal-to Noise Ratio	60 dB (Mono)		
		Frequency Response	150 - 8,000 Hz		
	AM [MW]	Tuning Range	522~1,611kHz, 530 ~1,610kHz		
		Intermediate Frequency	450 kHz		
[Amplifier]	Stereo mode		45W + 45 W (8Ω at 1 kHz, THD 10 %)		
	Surround mode (* Depending on the sound mode settings and the source, there may be no sound output.)		Front: 45W + 45W (THD 10 %) Centre*: 45W Surround*: 45W + 45W (8Ω at 1 kHz, THD 10 %) Subwoofer*: 60W (6Ω at 30 Hz, THD 10 %)		
	Inputs		VIDEO 1, VIDEO 2, COAXIAL AUDIO, OPTICAL AUDIO		
	Outputs		PHONES: (32Ω , 1.0 V)		
[Speakers]			Surround Speaker (LHS- T6440T)	Centre speaker (LHS- T6440C)	Passive Subwoofer (LHS- T6440W)
	Type		1 Way 1 Speaker	1 Way 1 Speaker	1Way 1Speaker
	Impedance		8Ω	8Ω	6Ω
	Frequency Response		150-20,000 Hz	150 -20,000 Hz	40 -1,500 Hz
	Sound Pressure Level		84 dB/W (1m)	83 dB/W (1m)	70 dB/W (1m)
	Rated Input Power		45W	45W	60 W
	Max. Input Power		90 W	90 W	120 W
	Net Dimensions (W x H x D)		93x132.5x 113 mm	210x132.5x 113 mm	160 x 350 x 330 mm
	Net Weight		0.6kg	0.65kg	4.5 kg
[Supplied Accessories]					
	<ul style="list-style-type: none"> Speakers6 AM loop antenna1 Remote control1 Speaker cables5 FM antenna1 Batteries (AAA)2 				

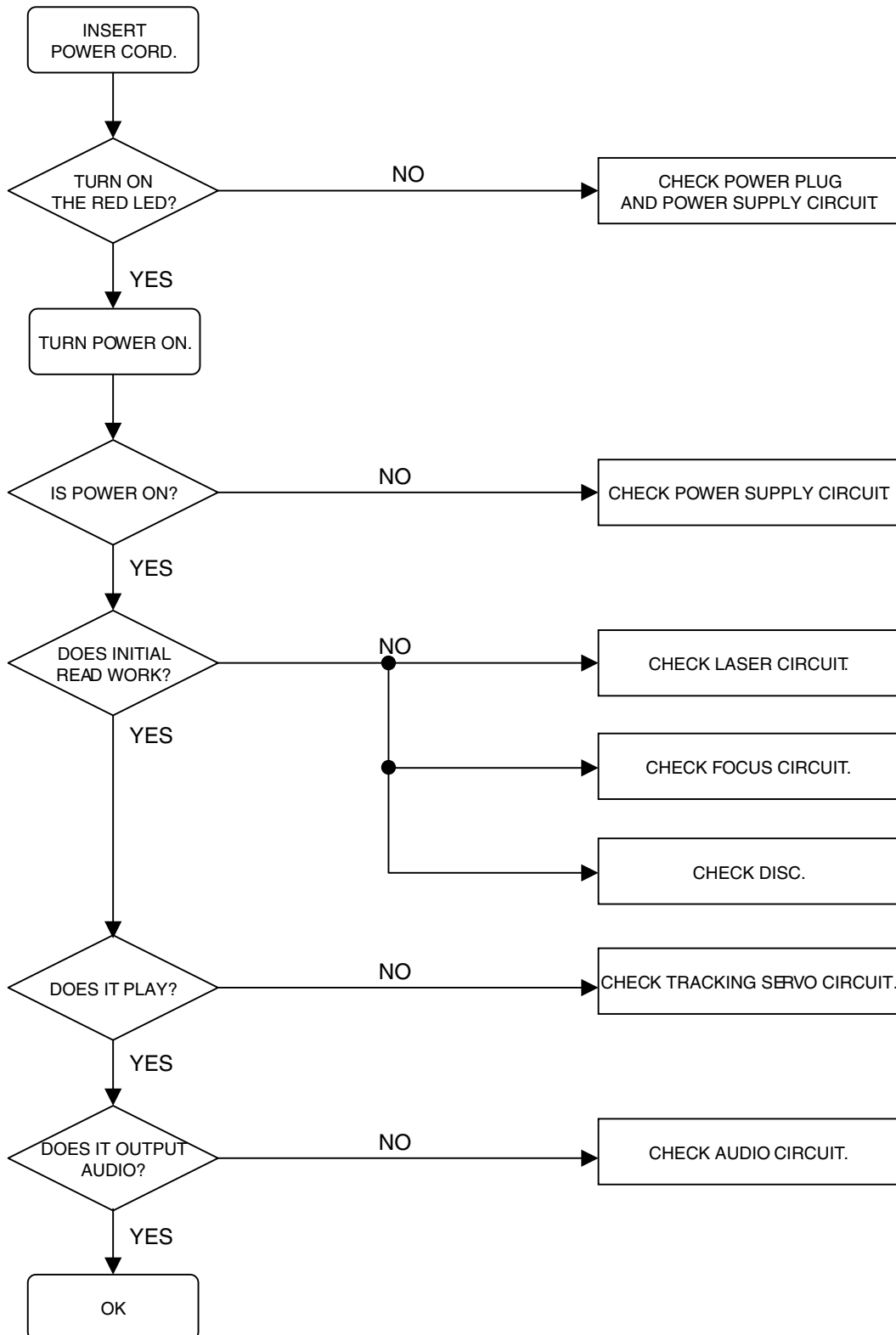
Designs and specifications are subject to change without notice.

MEMO

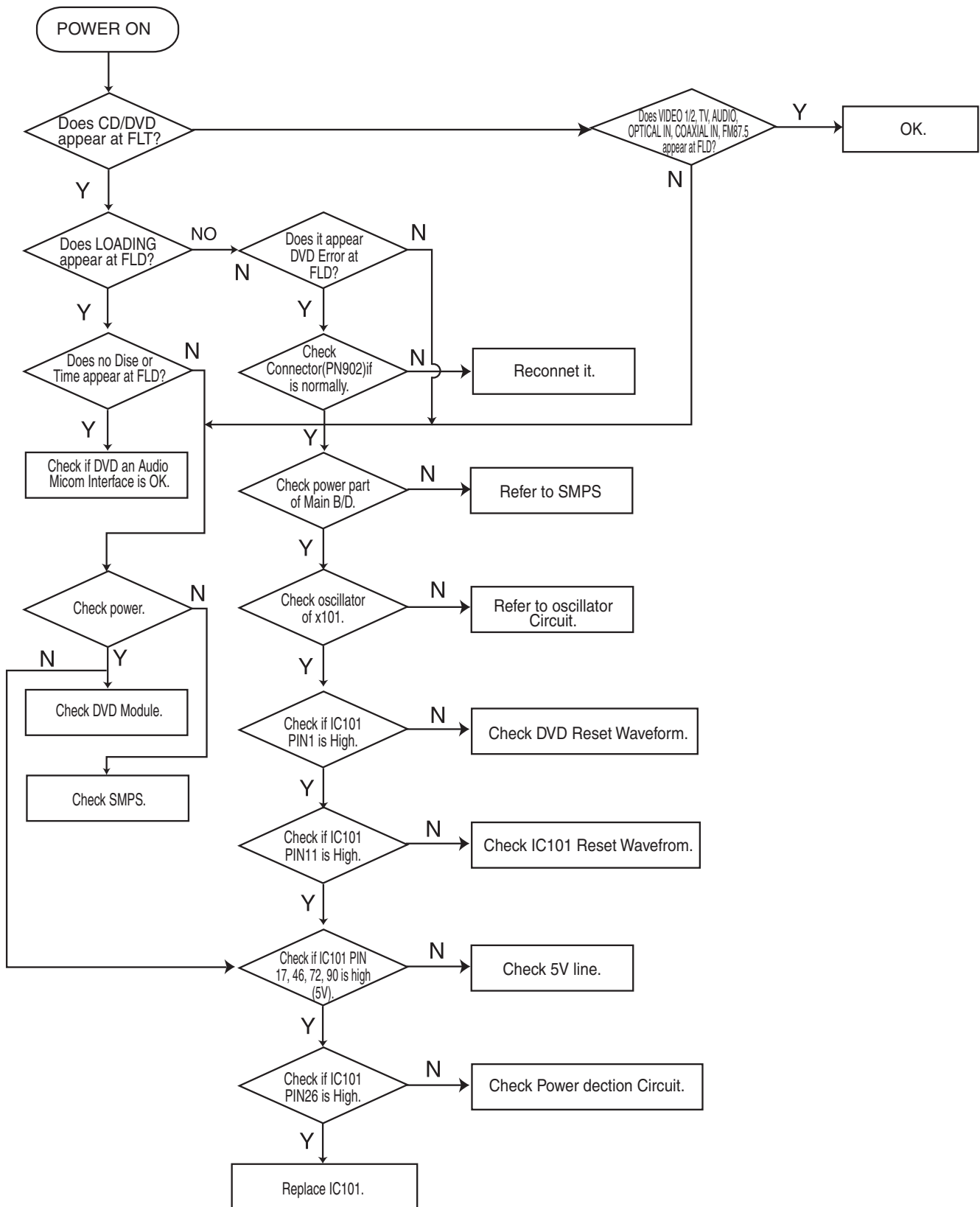
SECTION 2. AUDIO PART

□ ELECTRICAL TROUBLESHOOTING GUIDE

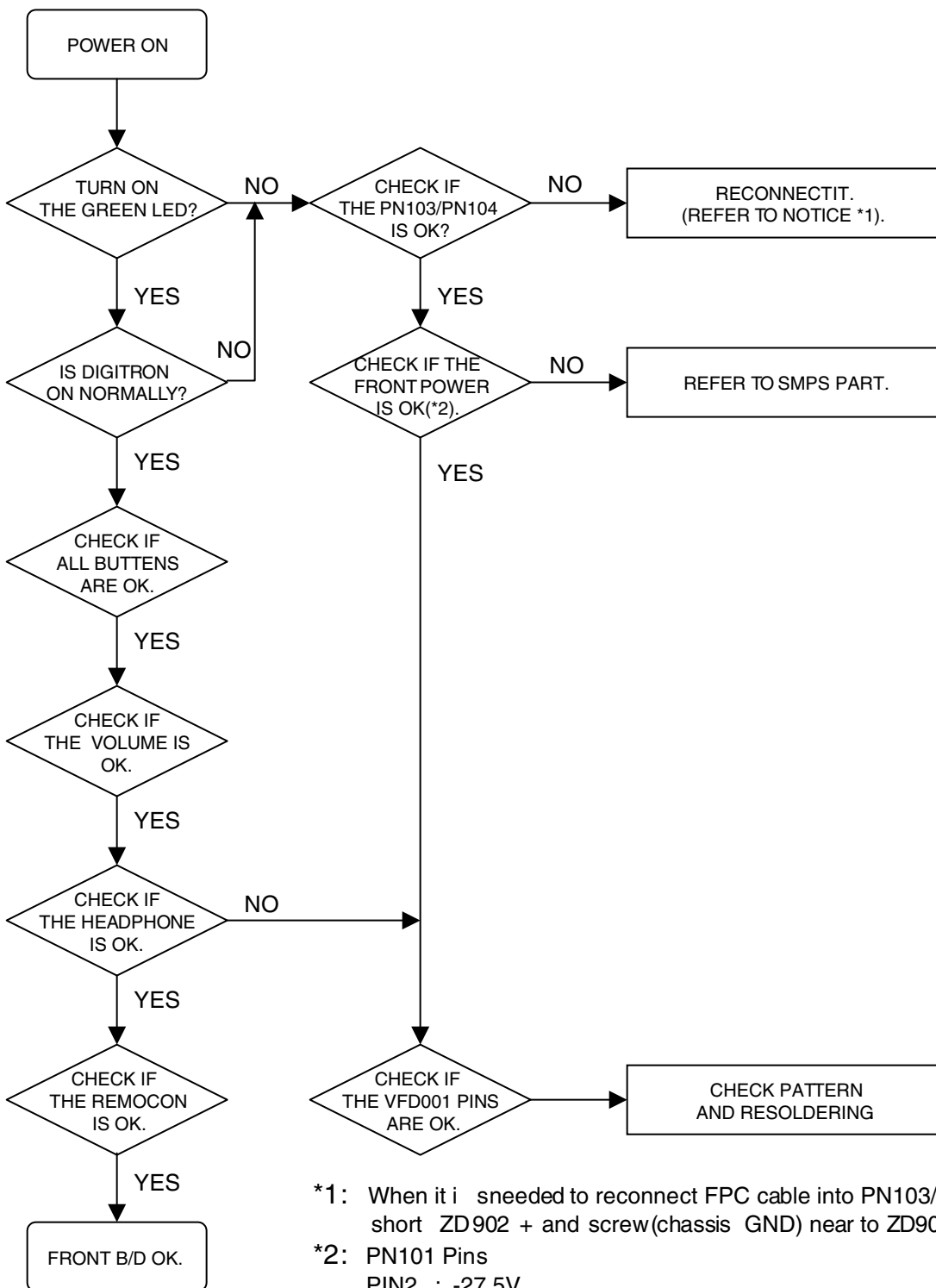
1. Power check flow



2.AUDIO μ .COM CIRCUIT



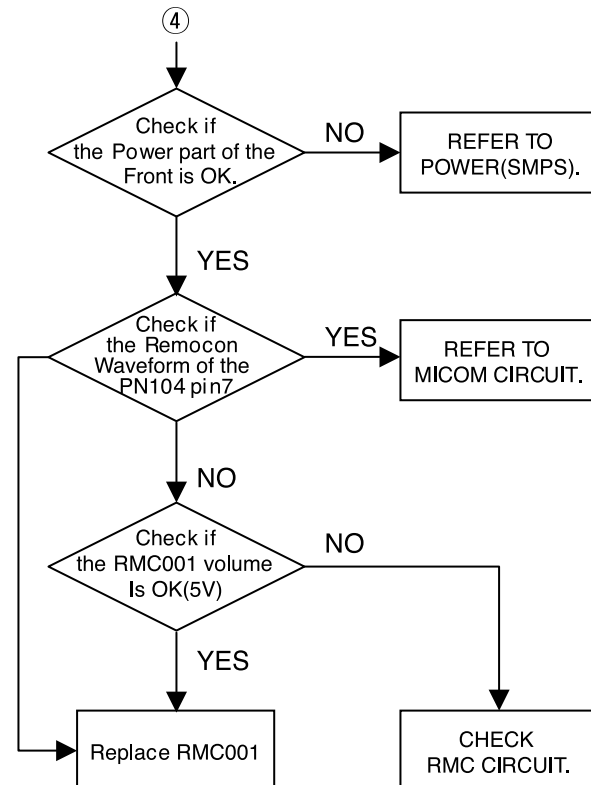
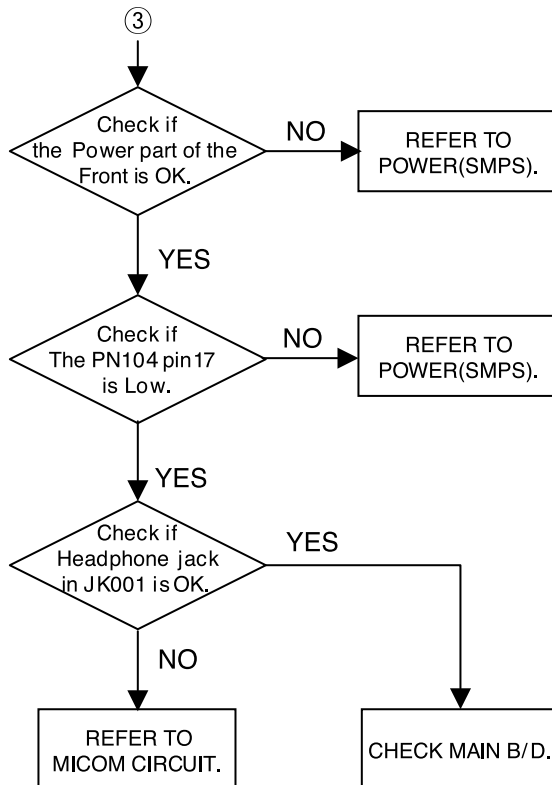
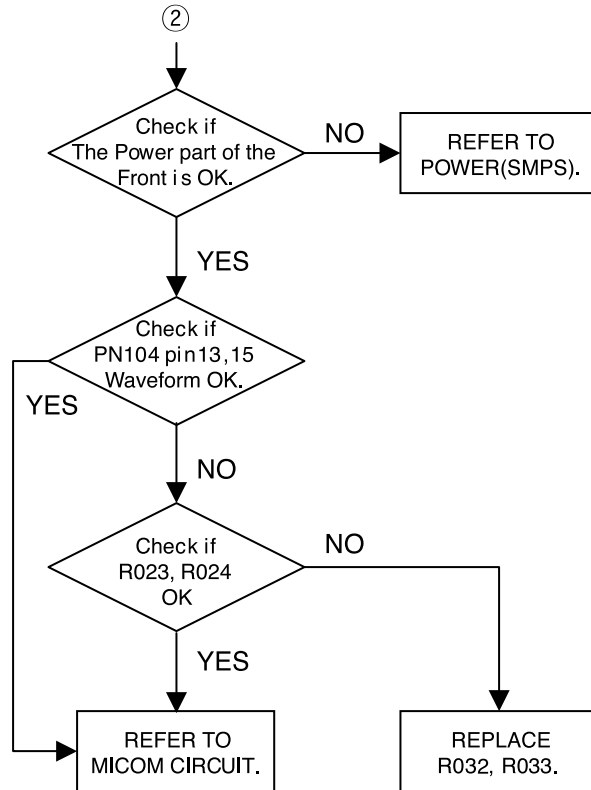
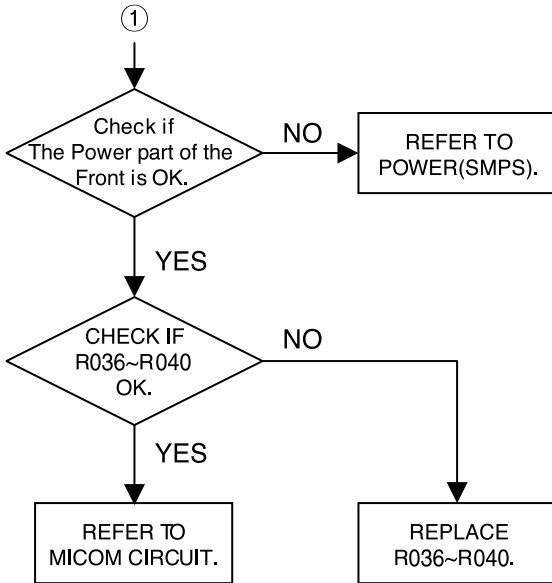
3.FRONT CIRCUIT (1/2)



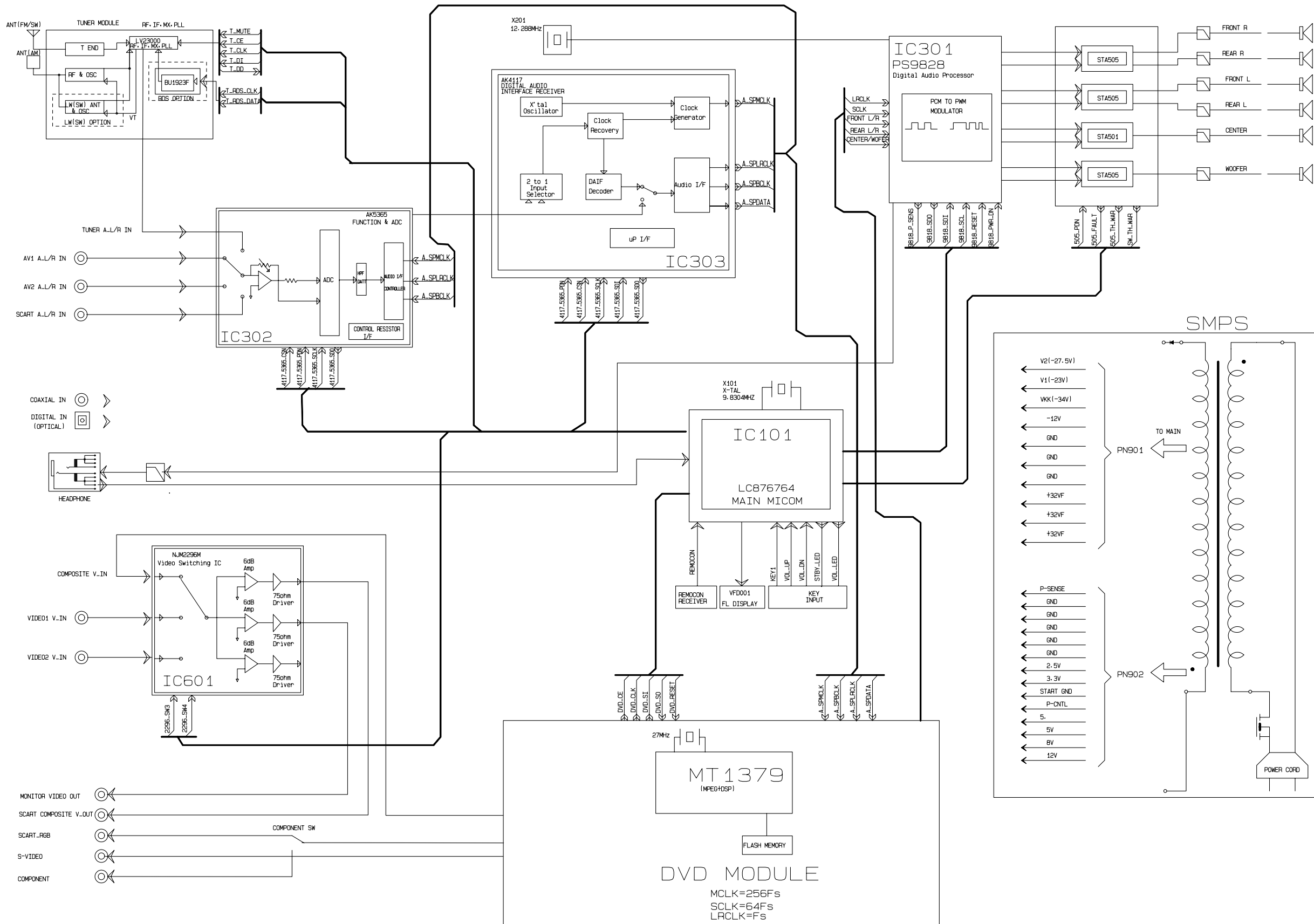
*1: When it is needed to reconnect FPC cable into PN103/PN104, short ZD902 + and screw(chassis GND) near to ZD902.

*2: PN101 Pins
 PIN2 : -27.5V
 PIN3 : -23.0V
 PIN4 : 5.0V
 PIN11 : -34.0V

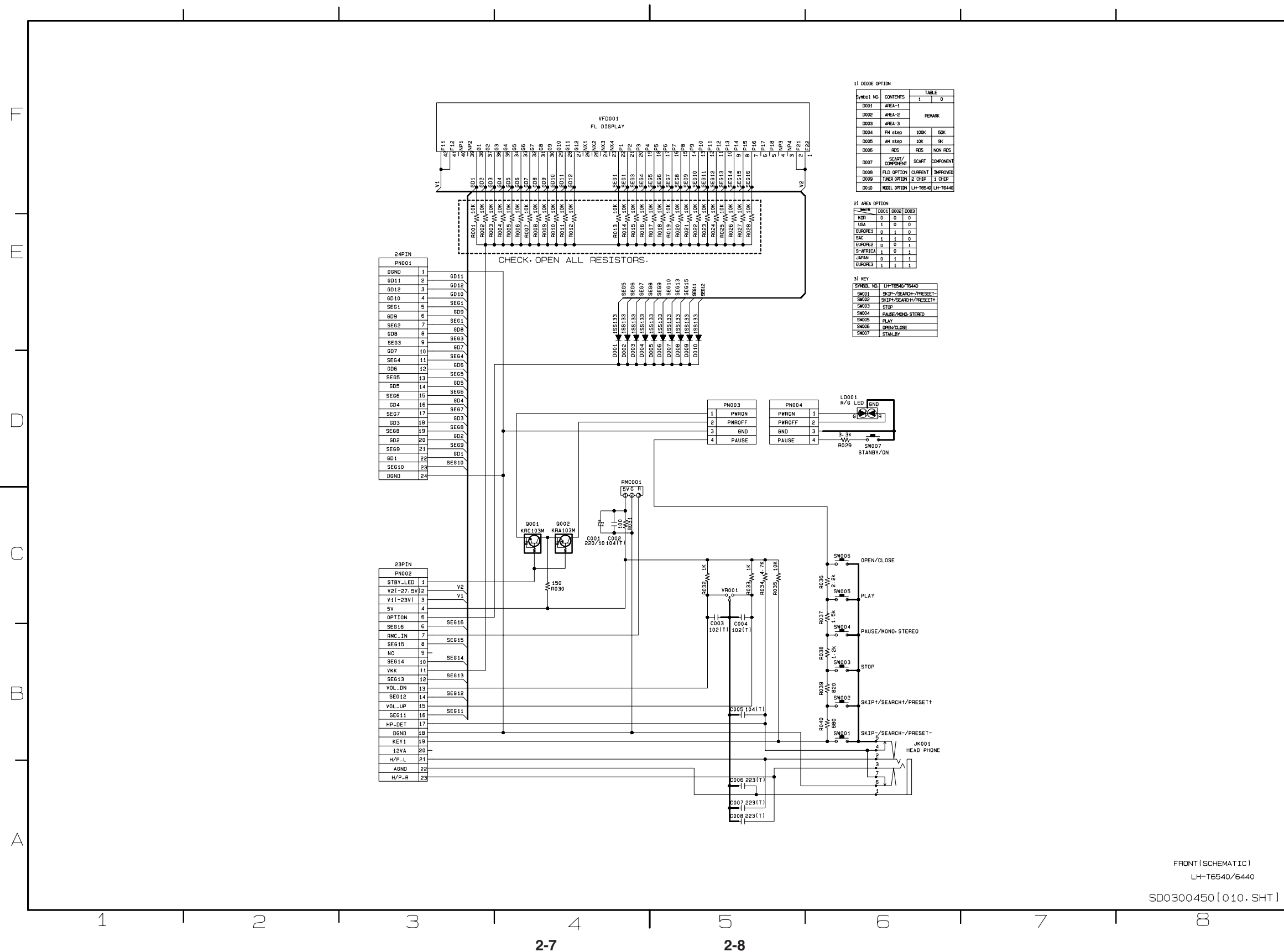
4.FRONT CIRCUIT (2/2)



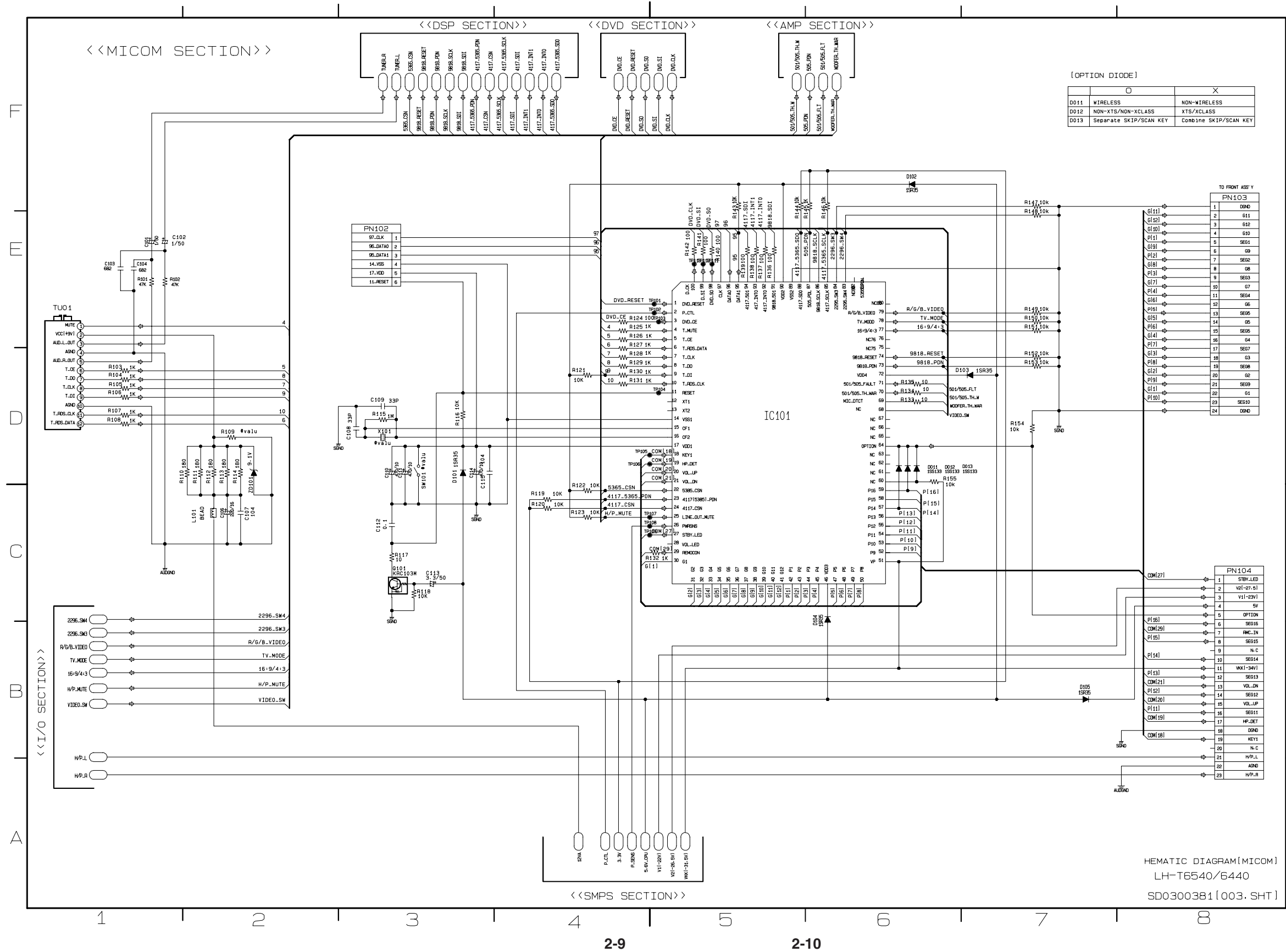
BLOCK DIAGRAM



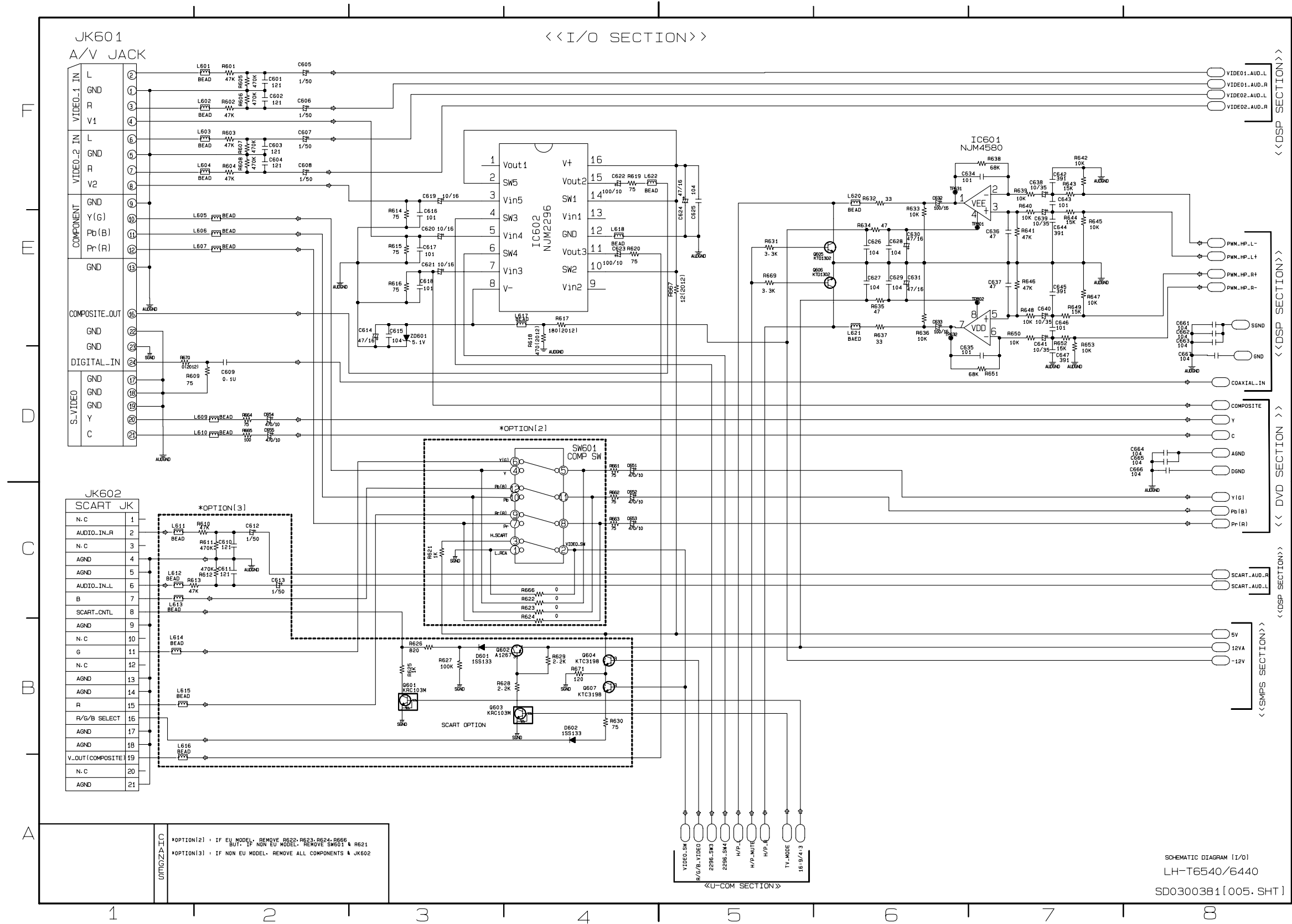
- **FRONT SCHEMATIC DIAGRAM**



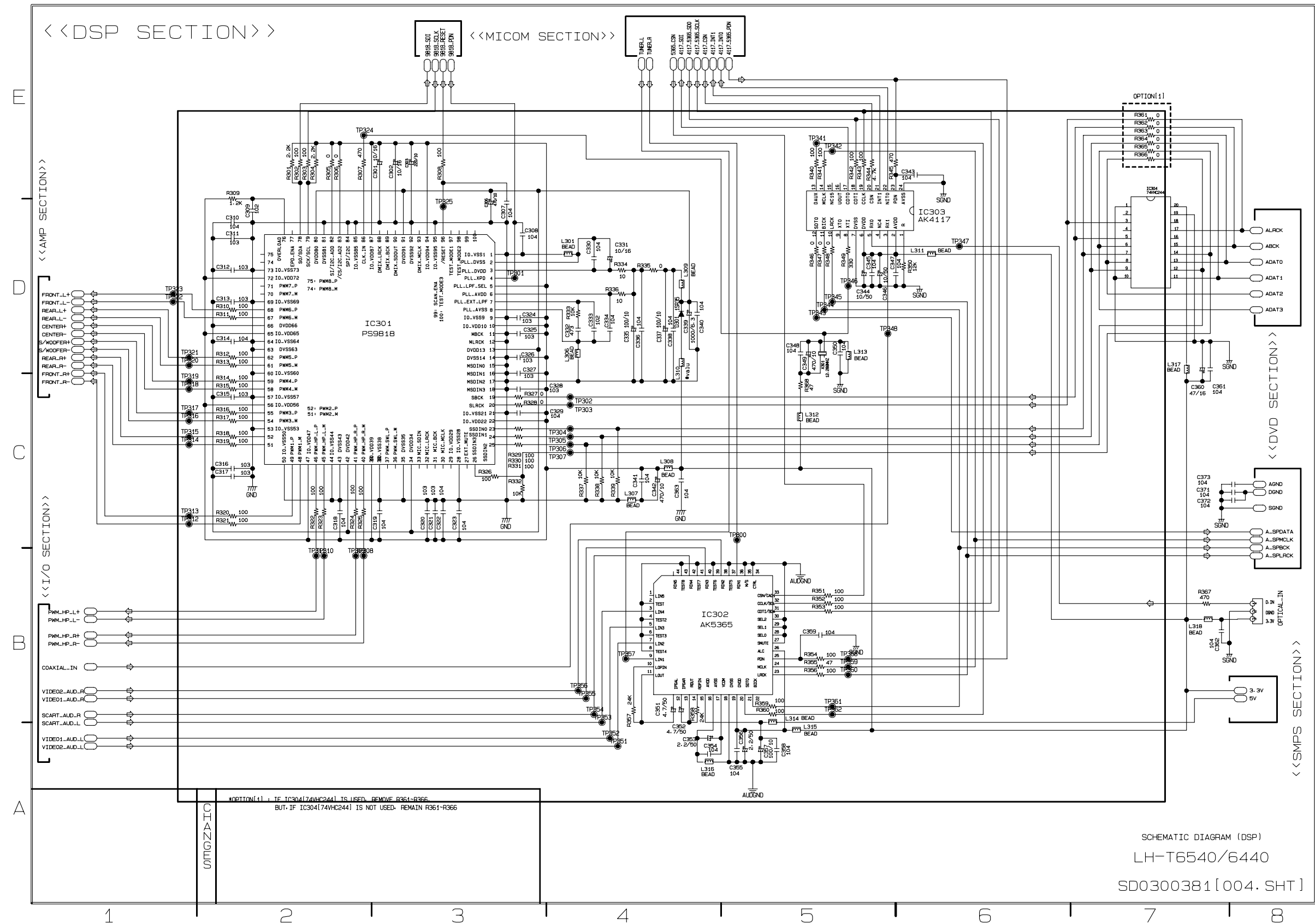
• MICOM SCHEMATIC DIAGRAM



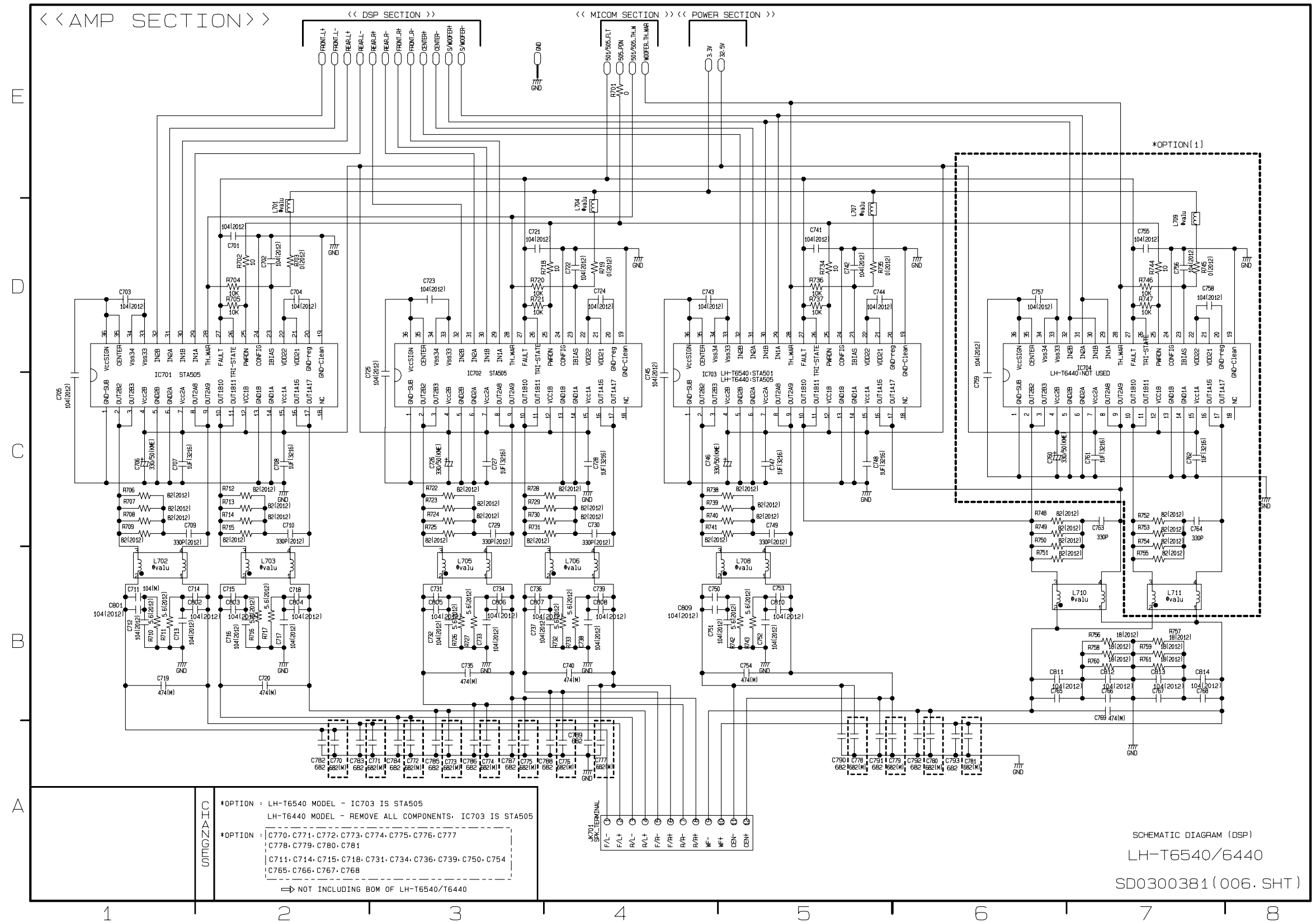
I/O SCHEMATIC DIAGRAM



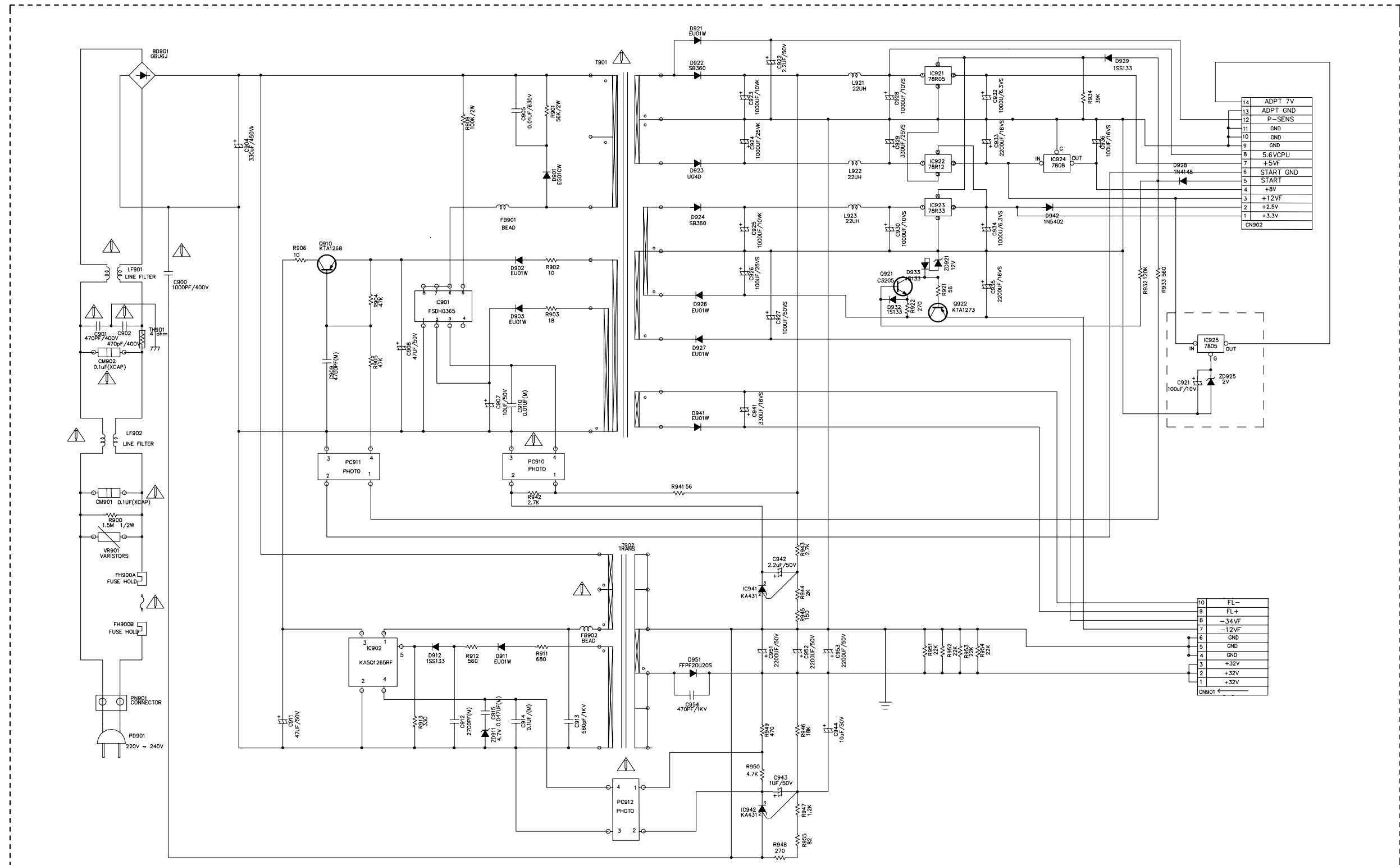
- **DSP SCHEMATIC DIAGRAM**



- **AMP SCHEMATIC DIAGRAM**



- **SMPS SCHEMATIC DIAGRAM**

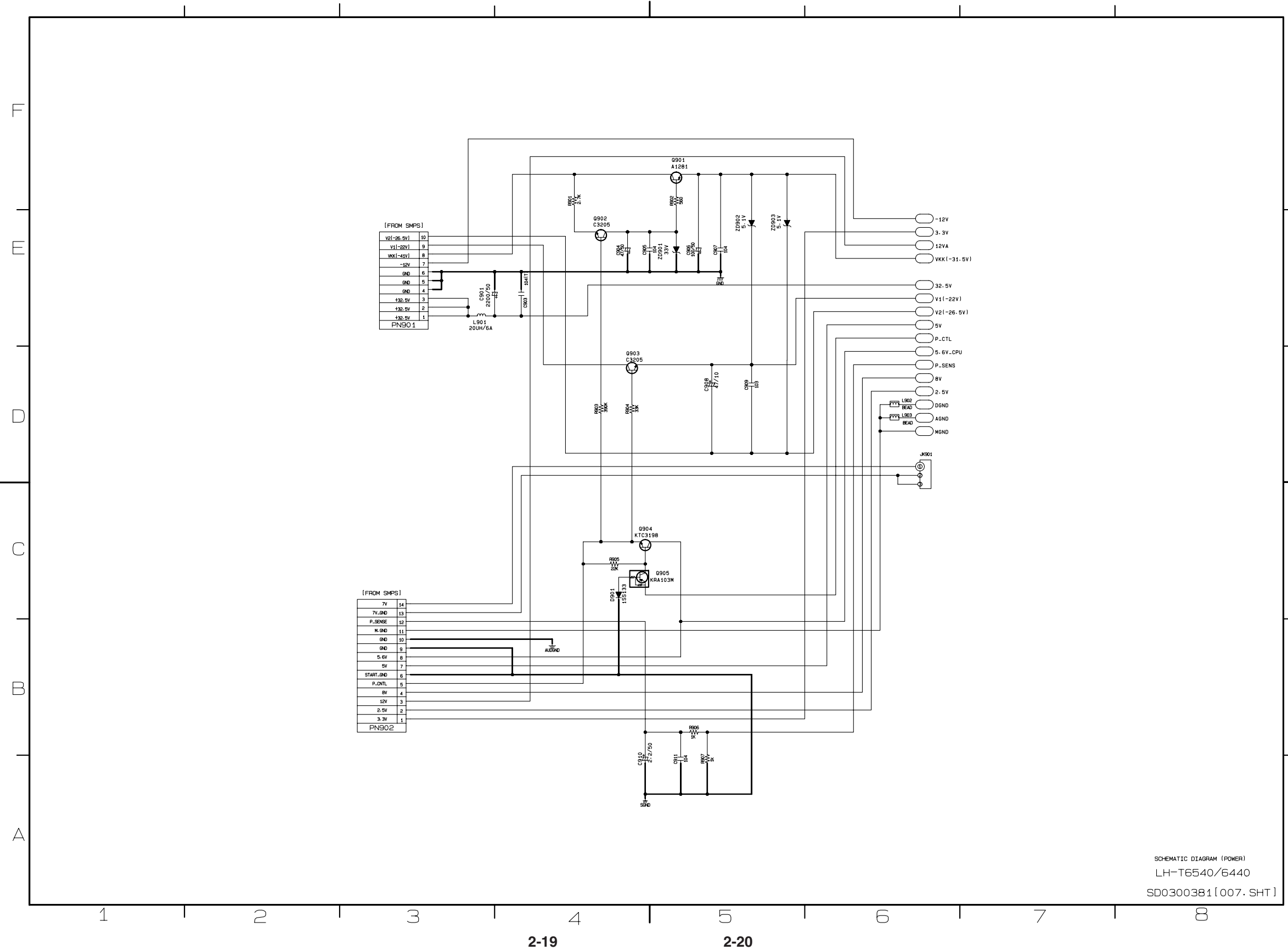


SCHEMATIC(SMPS-WIDE)

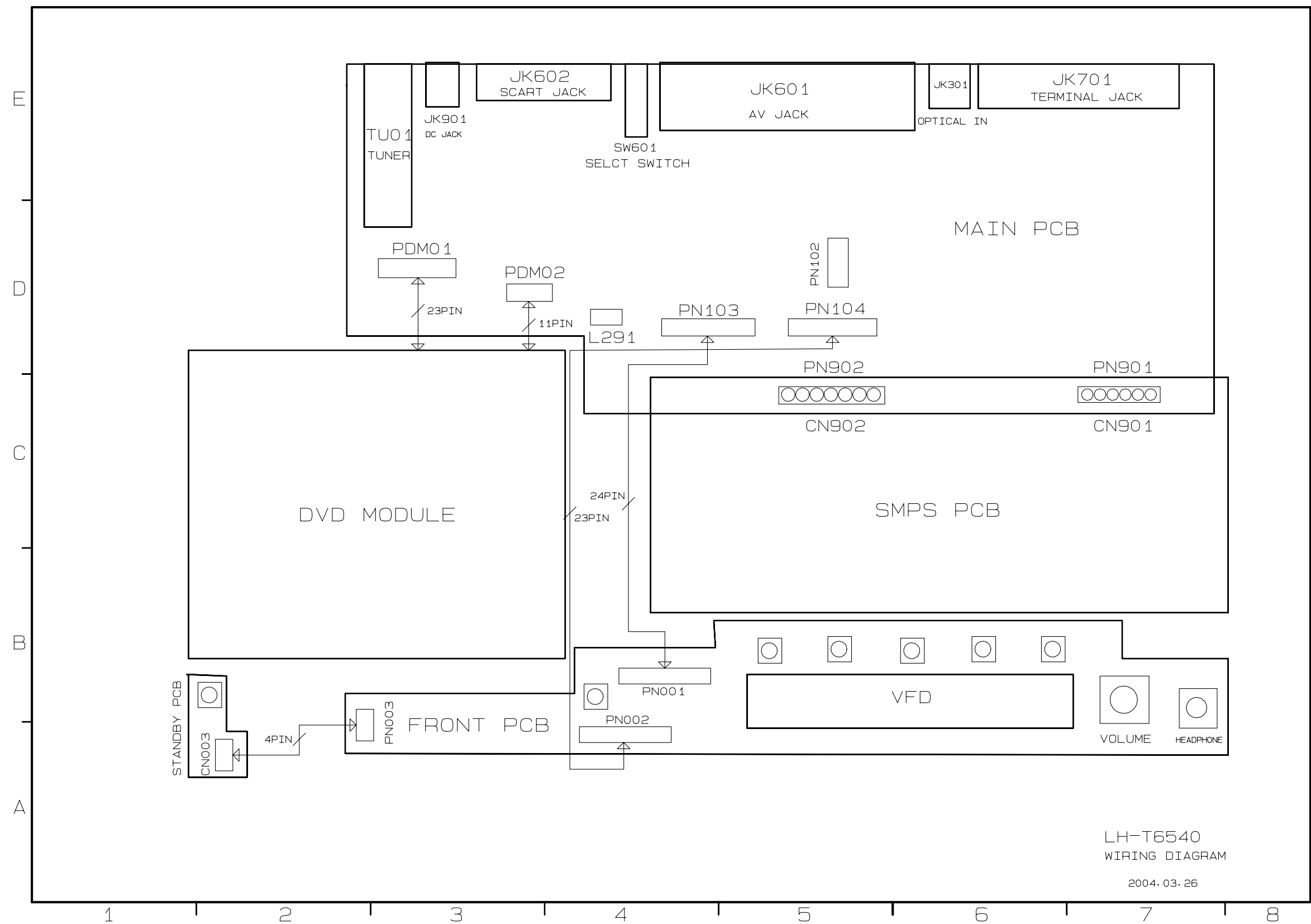
LH-T6540

VD 3854R16540A

- **POWER SCHEMATIC DIAGRAM**



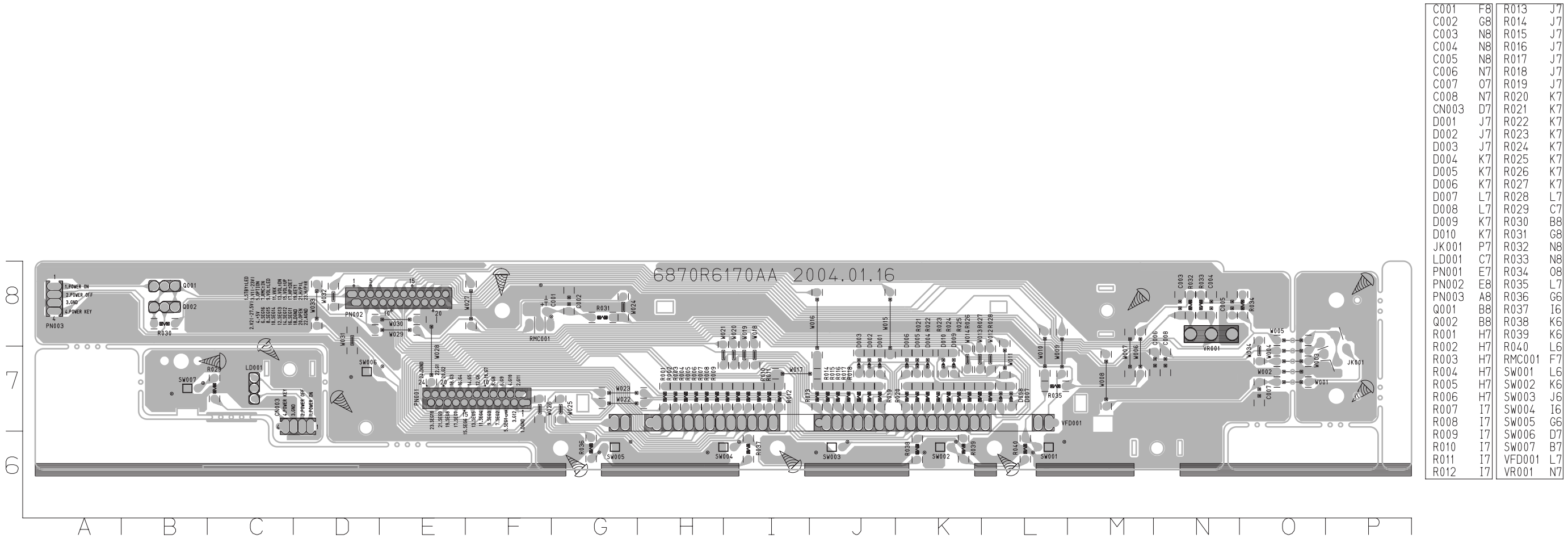
❑ WIRING DIAGRAMS



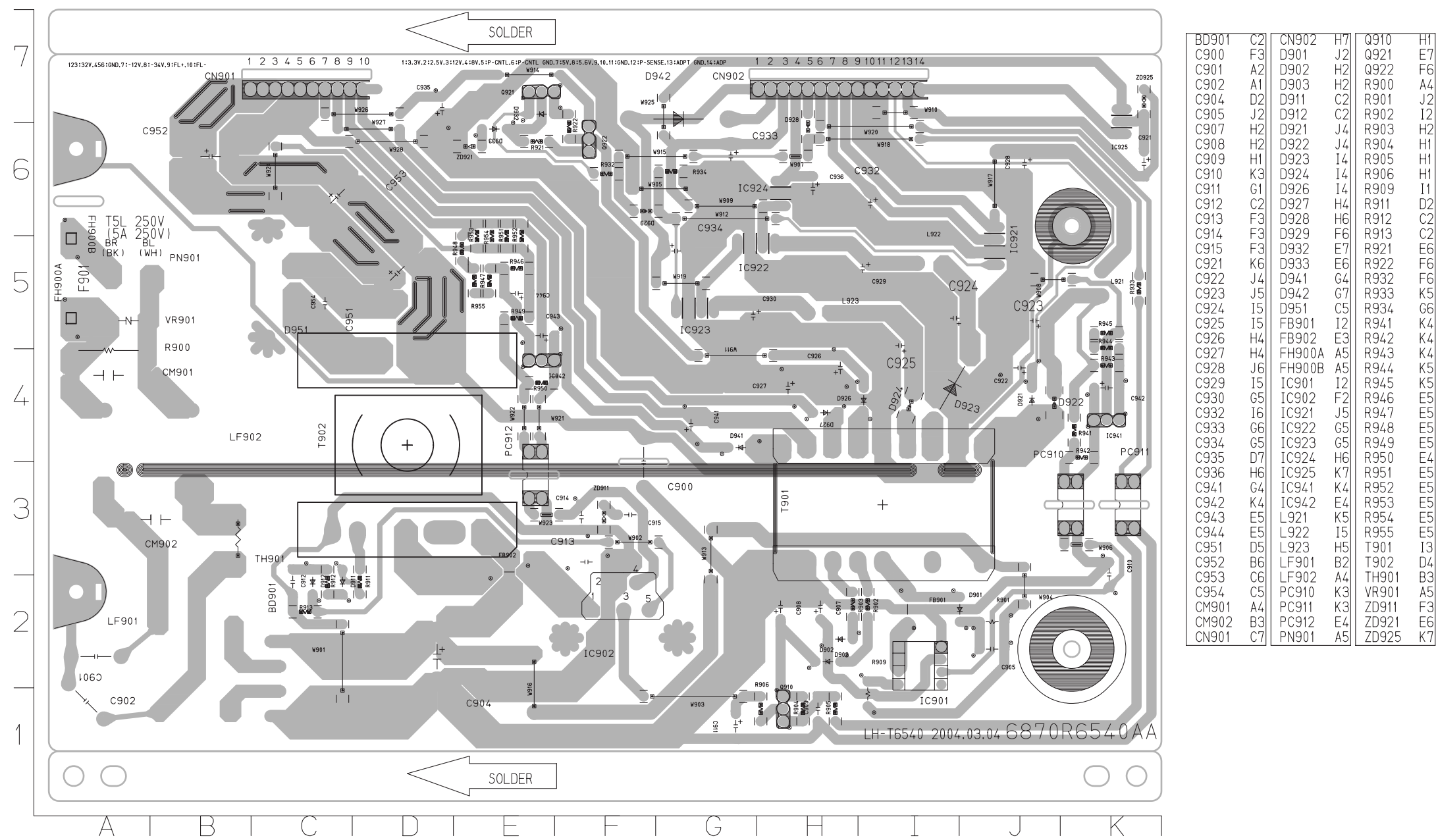
• **MAIN P.C. BOARD (COMPONENT SIDE)**



• FRONT P.C.BOARD



• SMPS P.C.BOARD

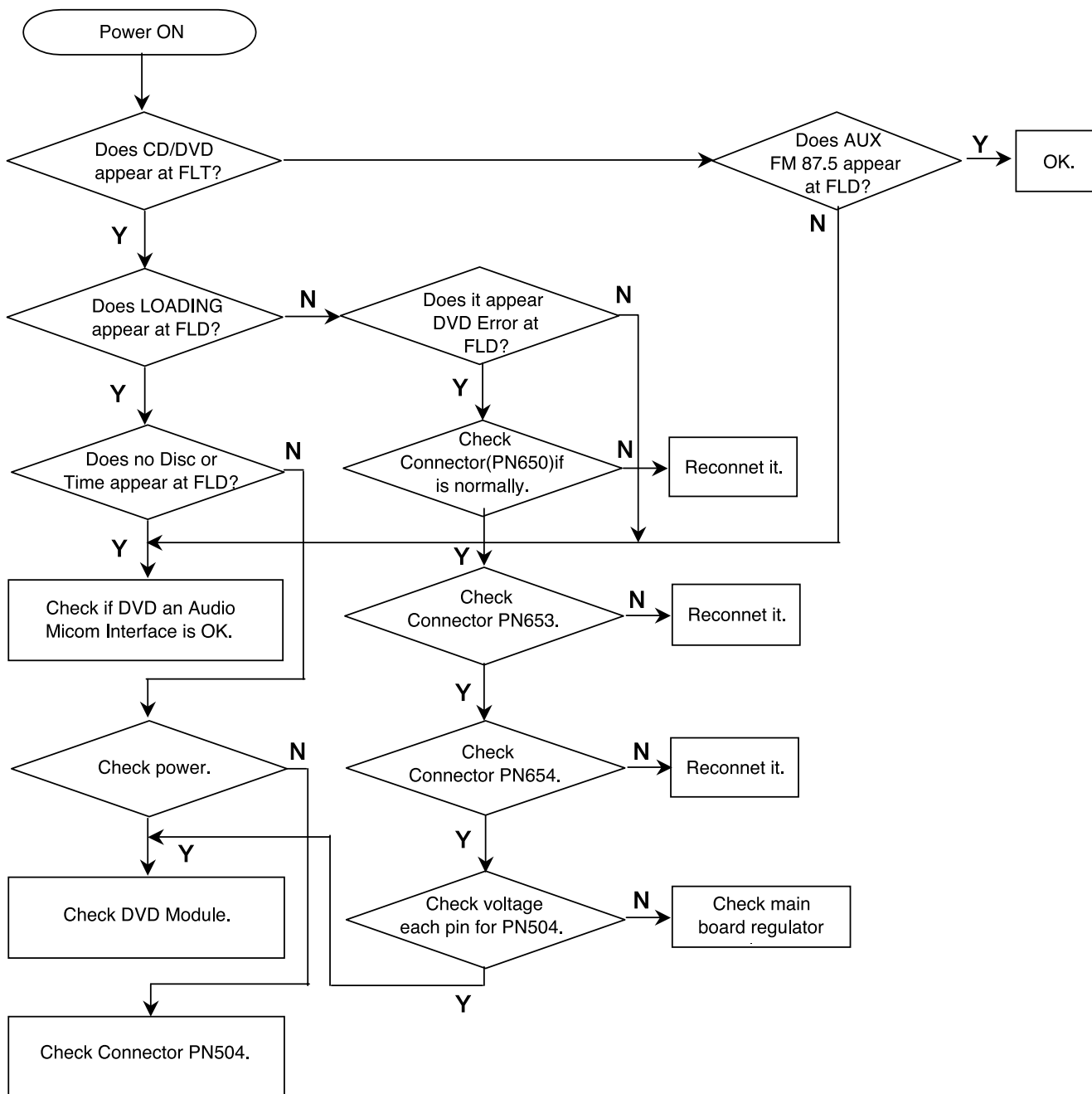


MEMO

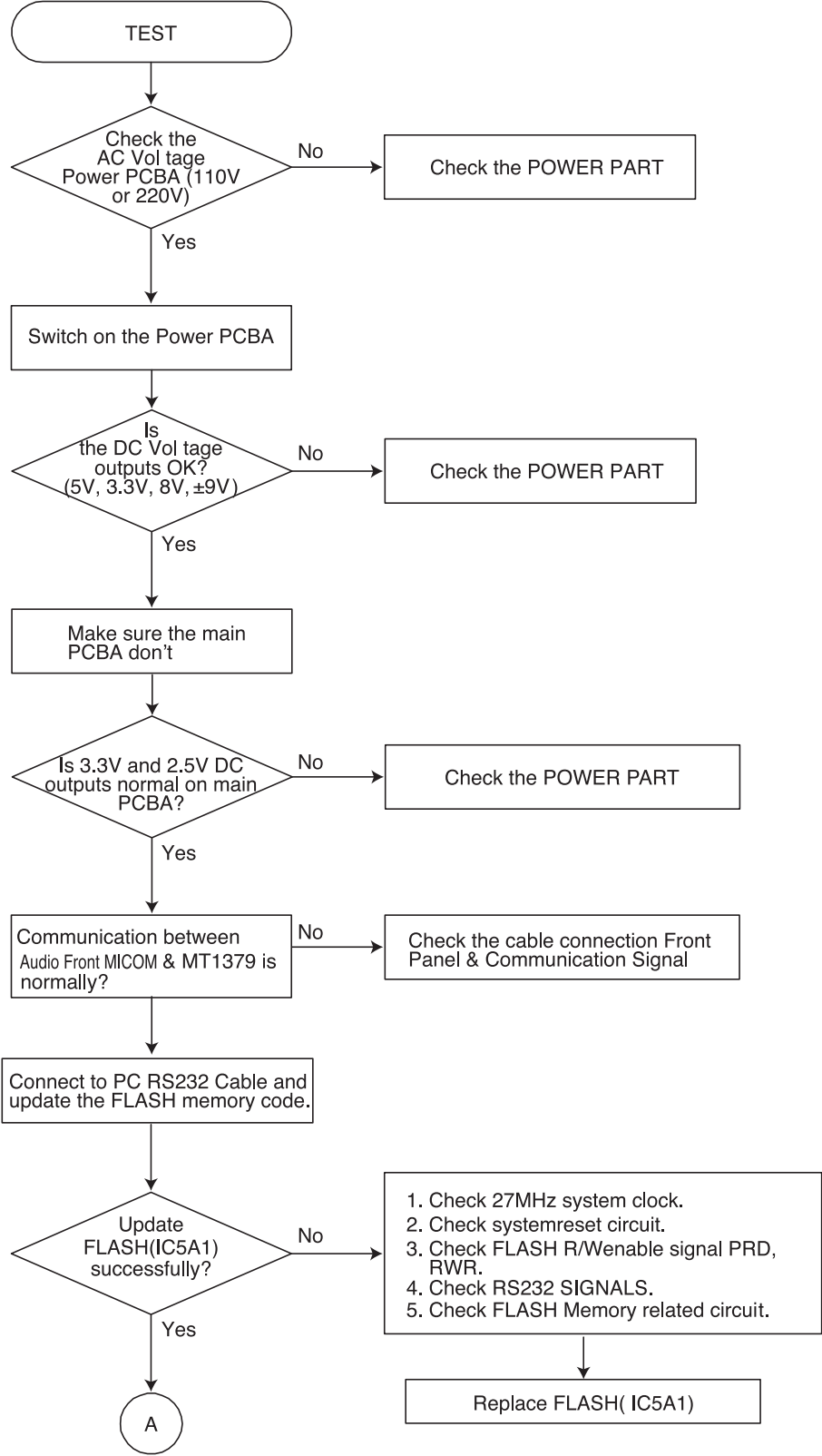
MEMO

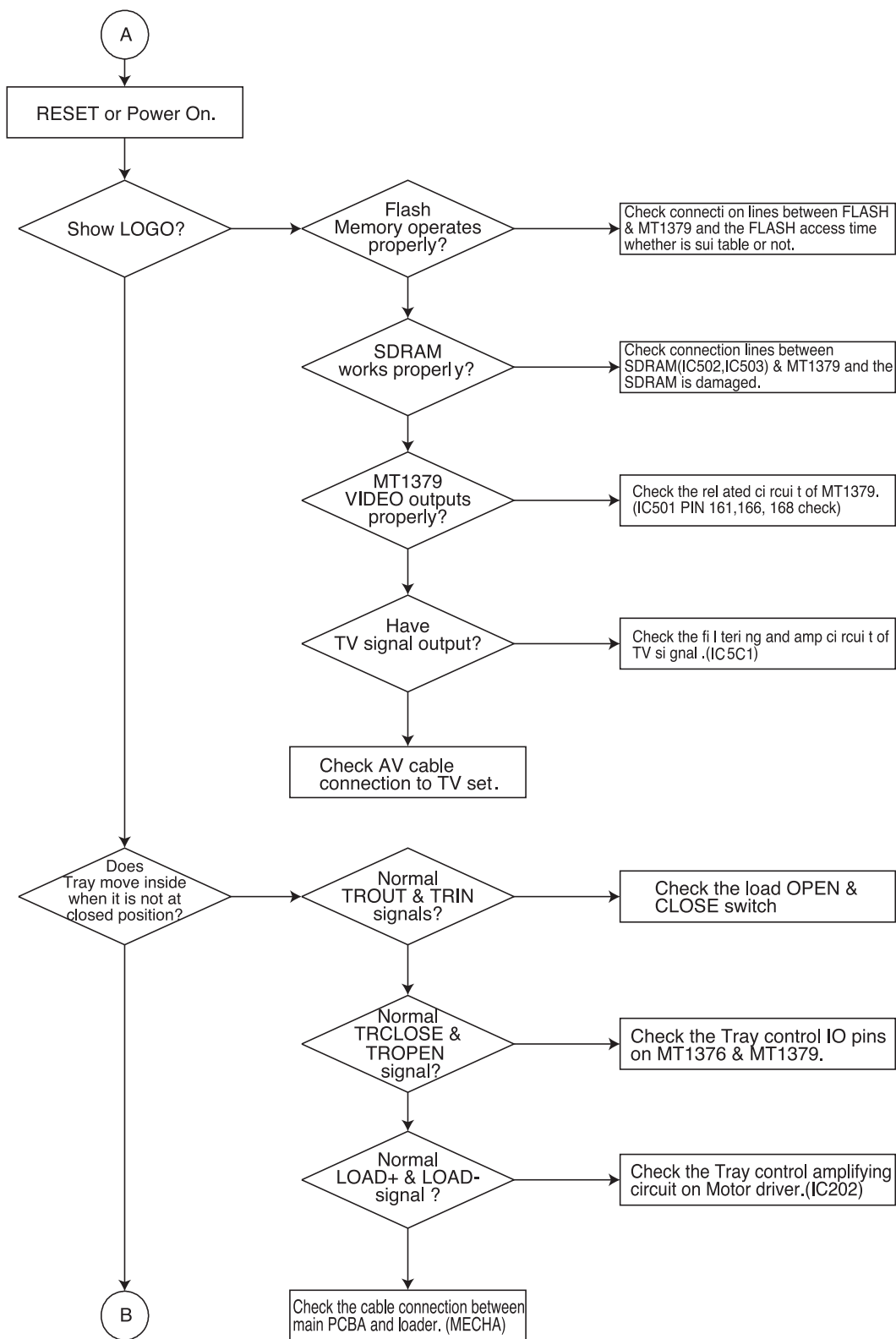
SECTION 3. DVD PART ELECTRICAL TROUBLESHOOTING GUIDE

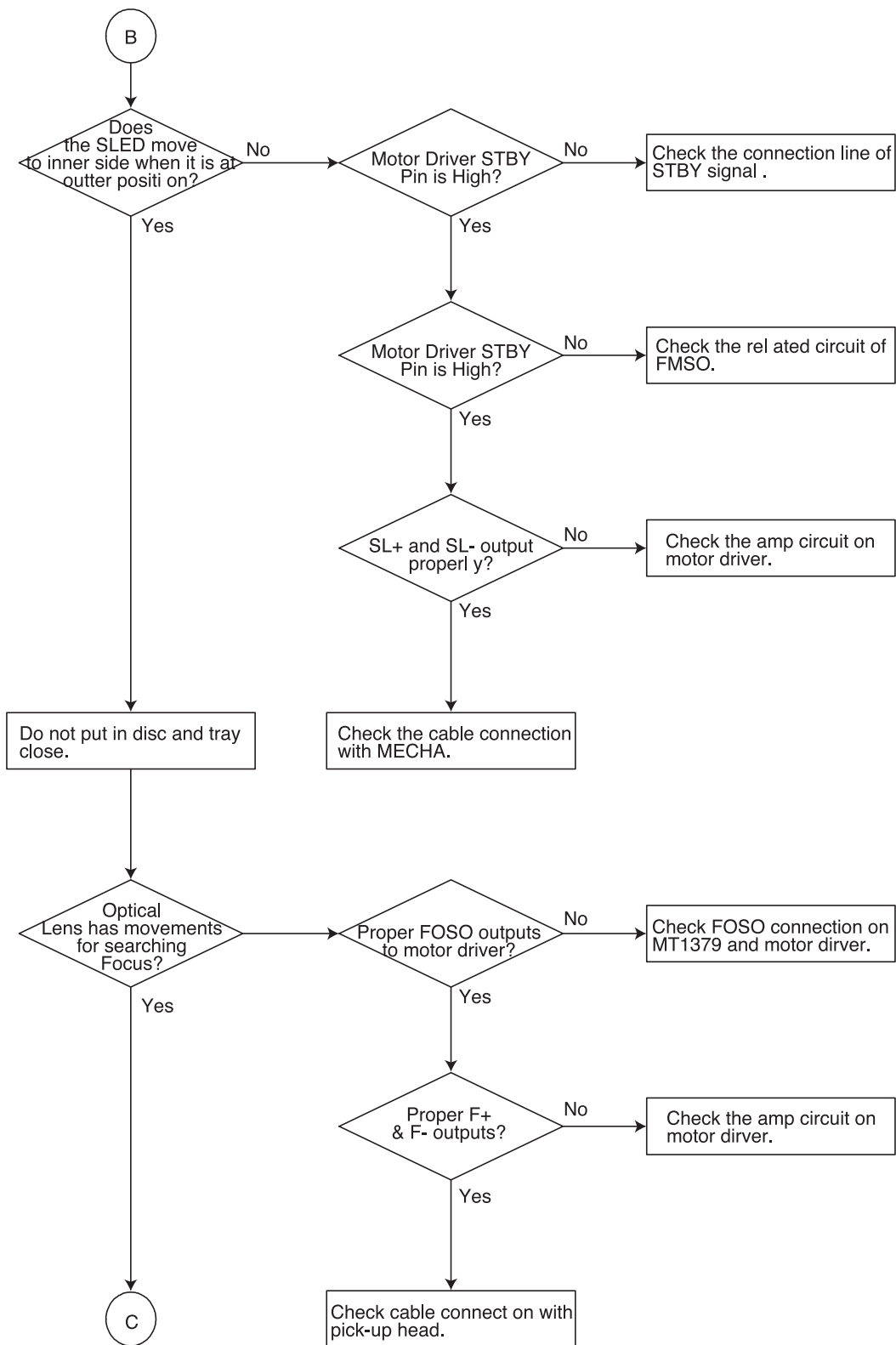
1. Power check flow

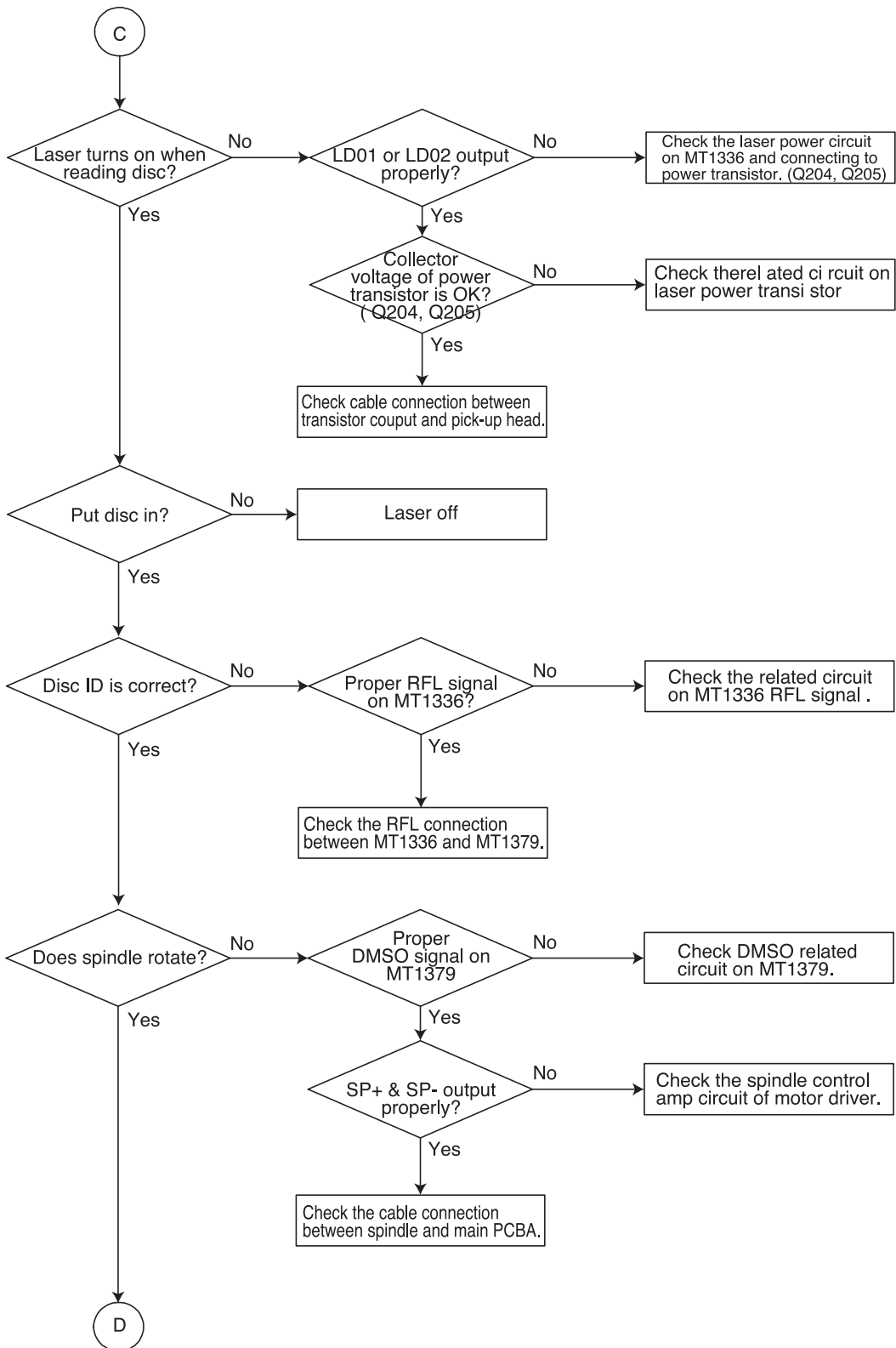


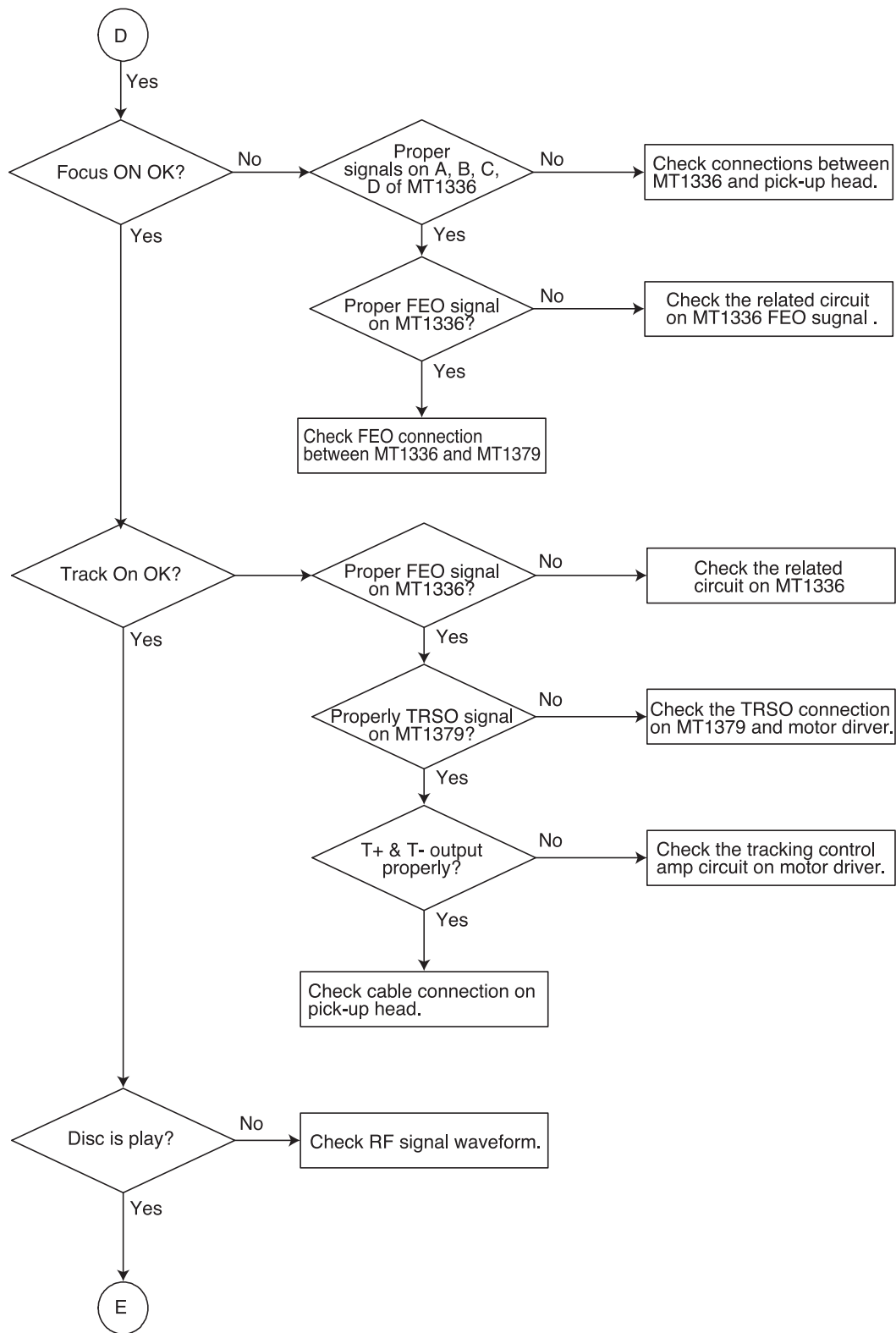
2. Test & debug flow

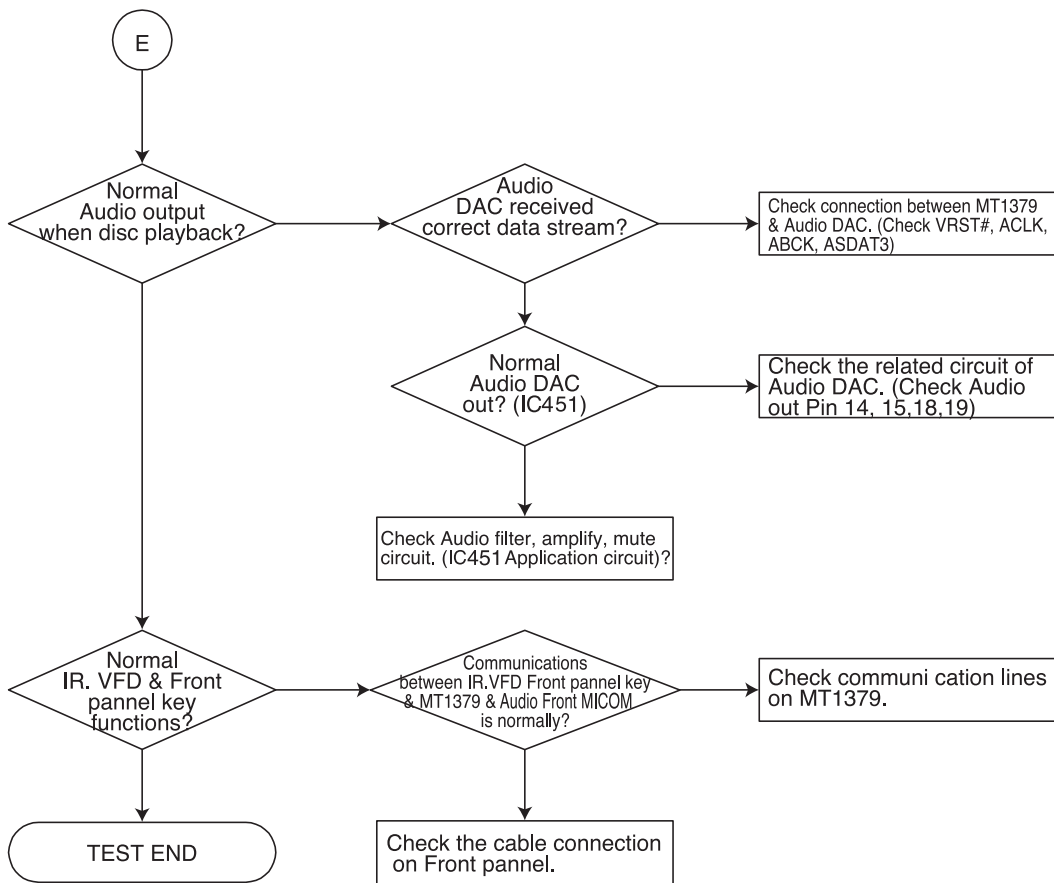












❑ DETAILS AND W VEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL

1) MT1379 main clock is at 27MHz(X501)

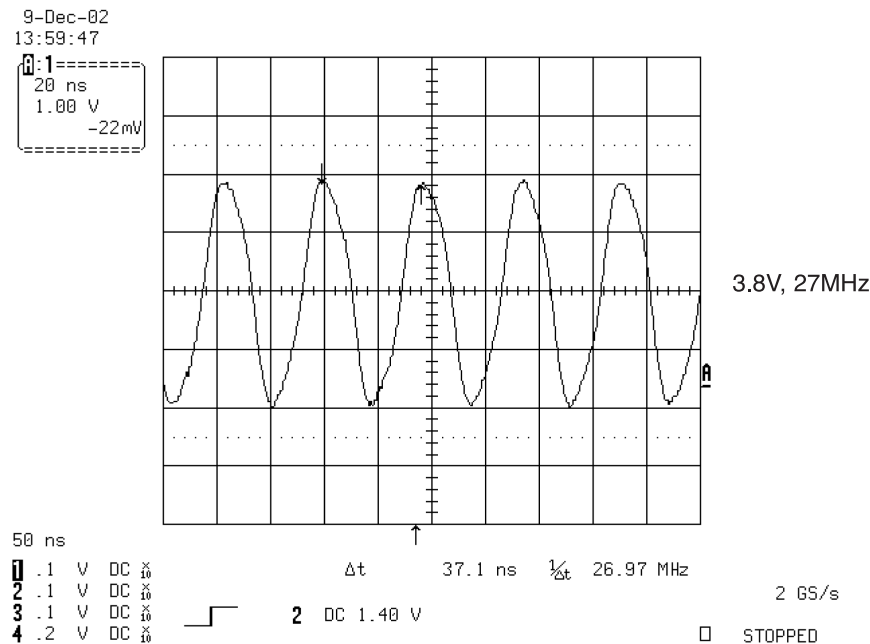


FIG 1-1

2) MT1336 reset is high active

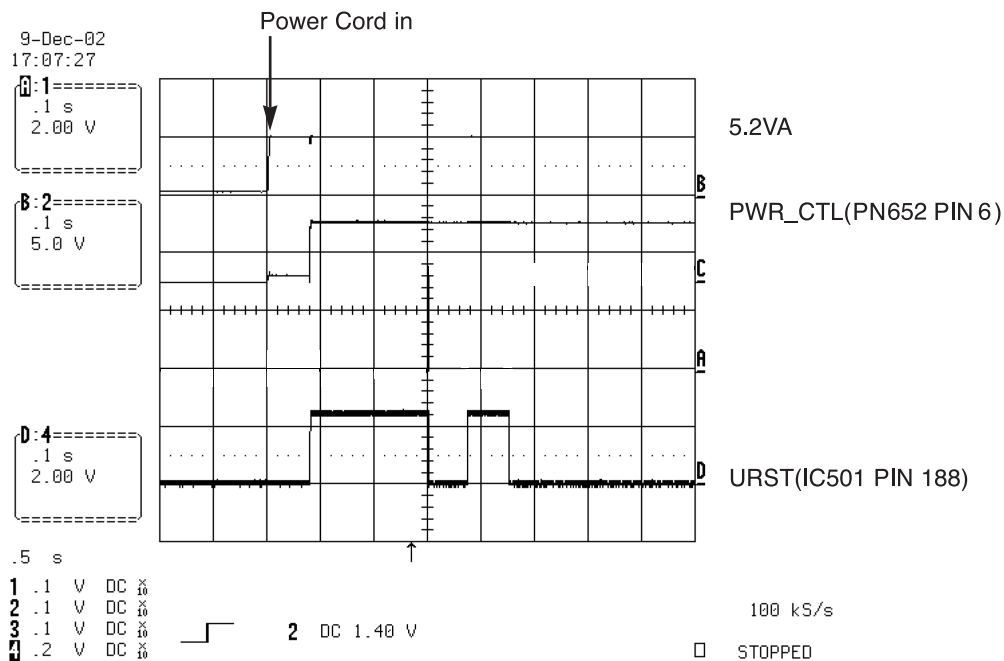


FIG 1-2

3) RS232 waveform during procedure(Downloading)

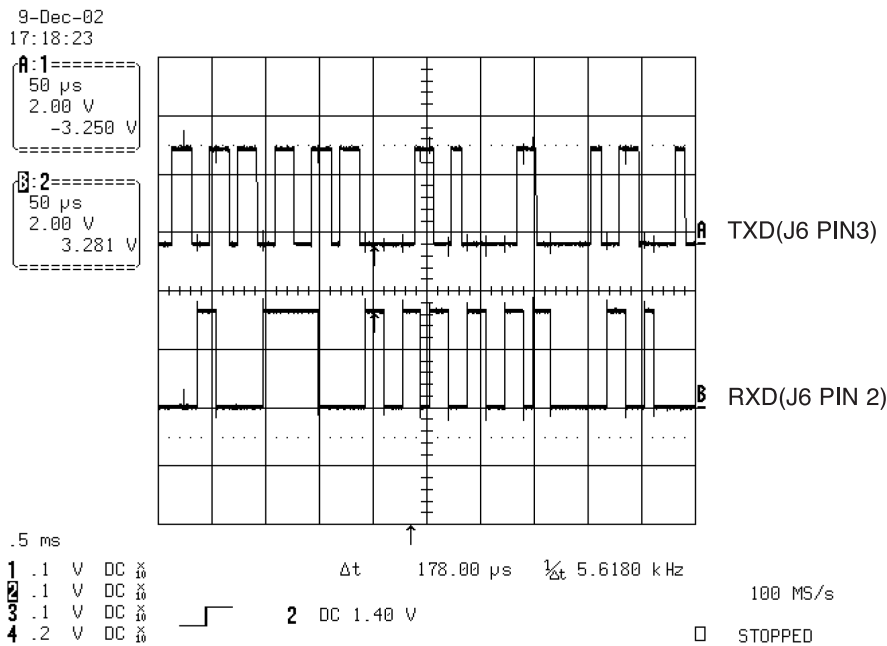


FIG 1-3

4) Flash R/W enable signal during download(Downloading)

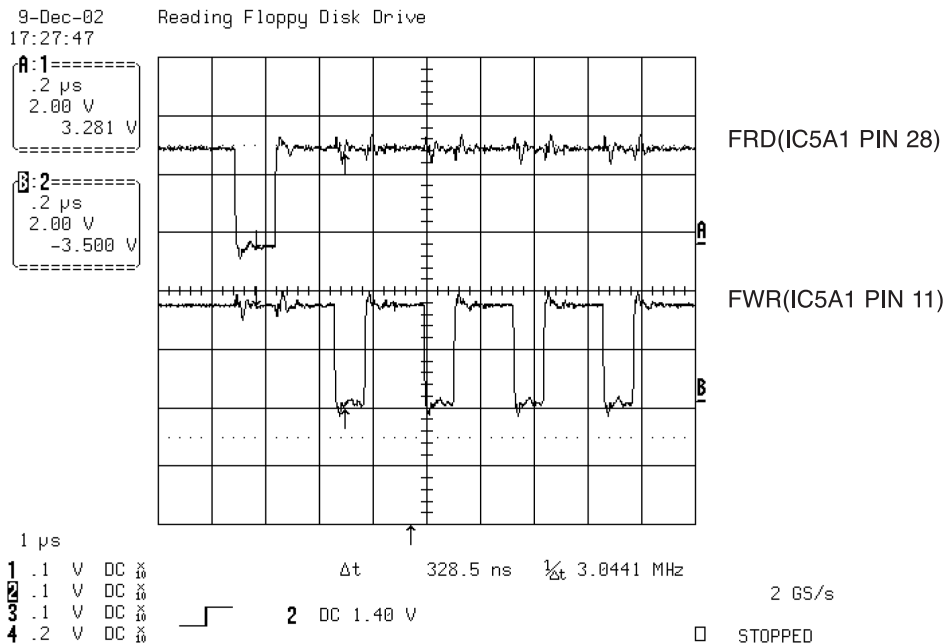


FIG 1-4

2. SDRAM CLOCK

1) MT1379 main clock is at 27MHz(X501)

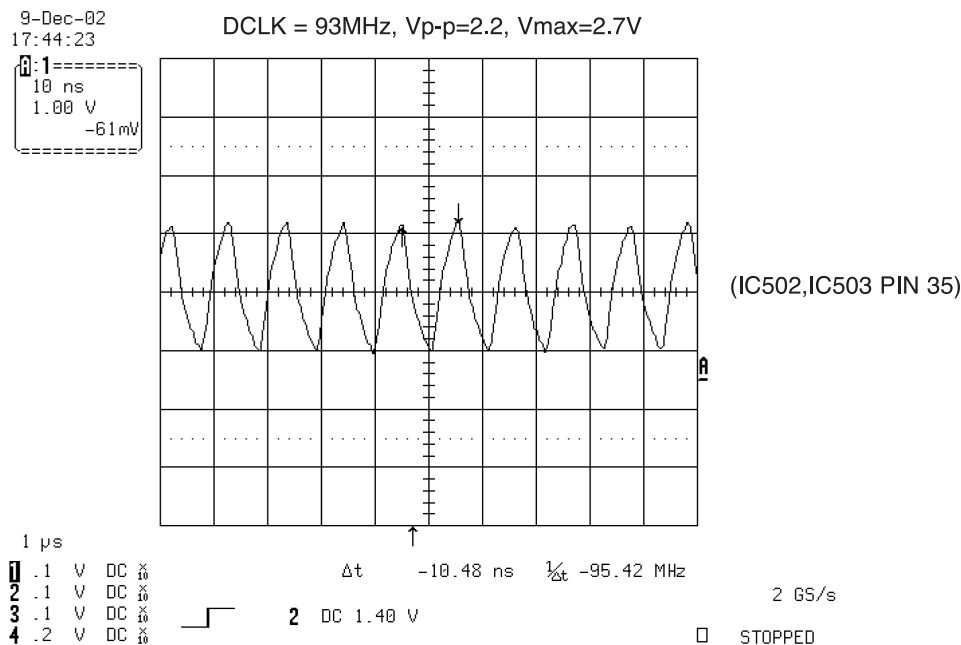


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

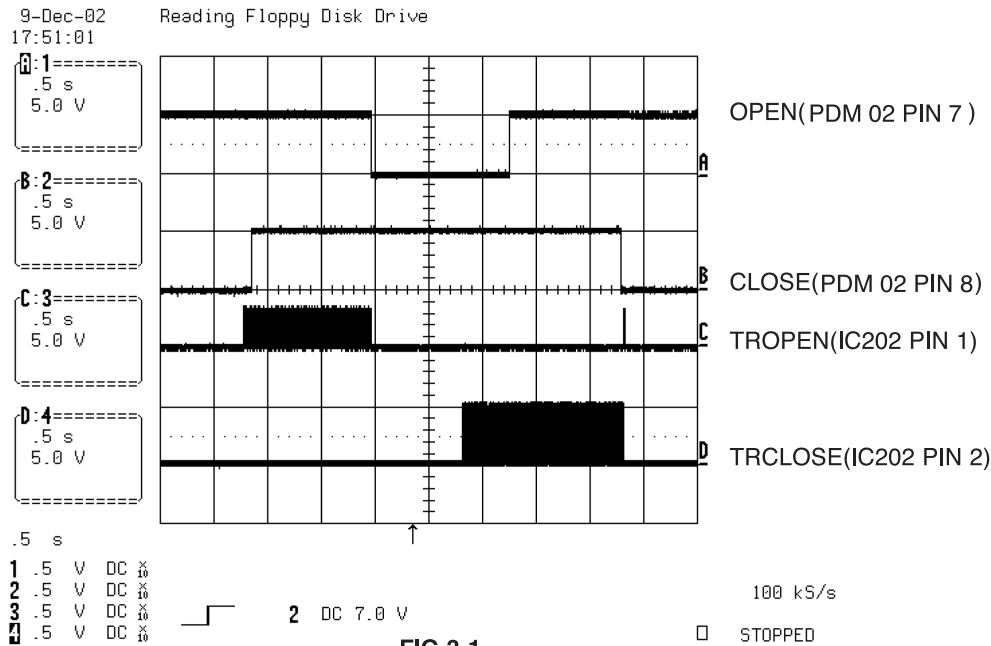


FIG 3-1

2) Tray close waveform

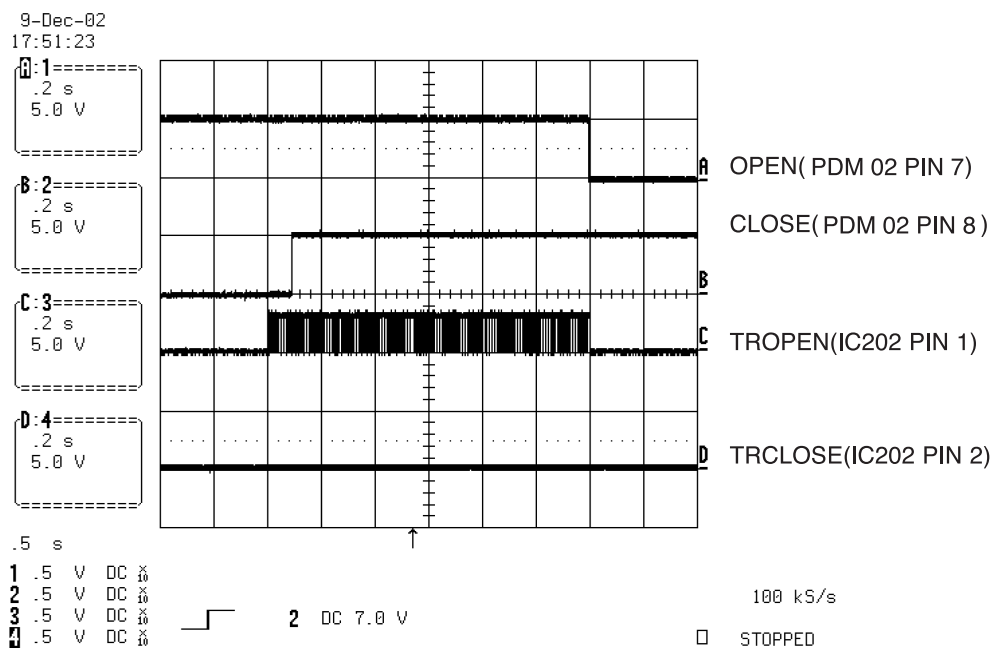


FIG 3-2

3) Tray open waveform

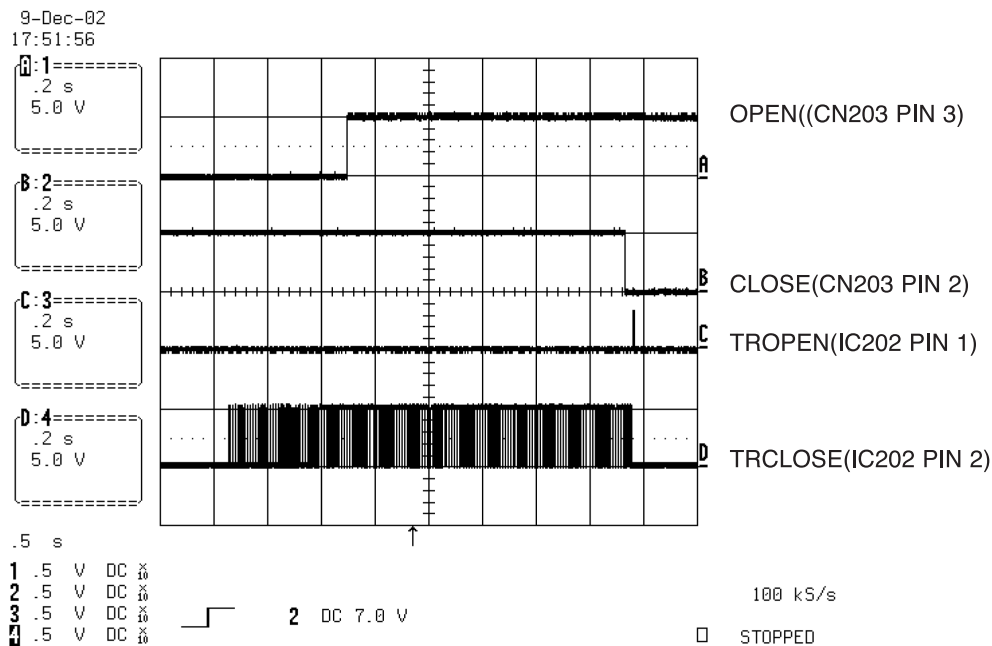


FIG 3-3

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

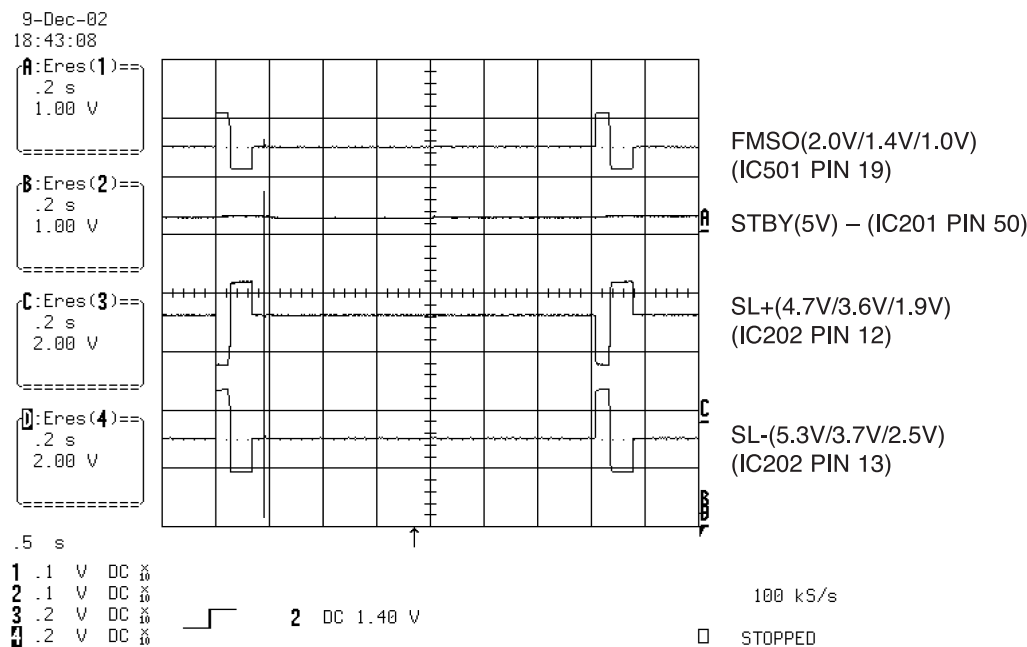


FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

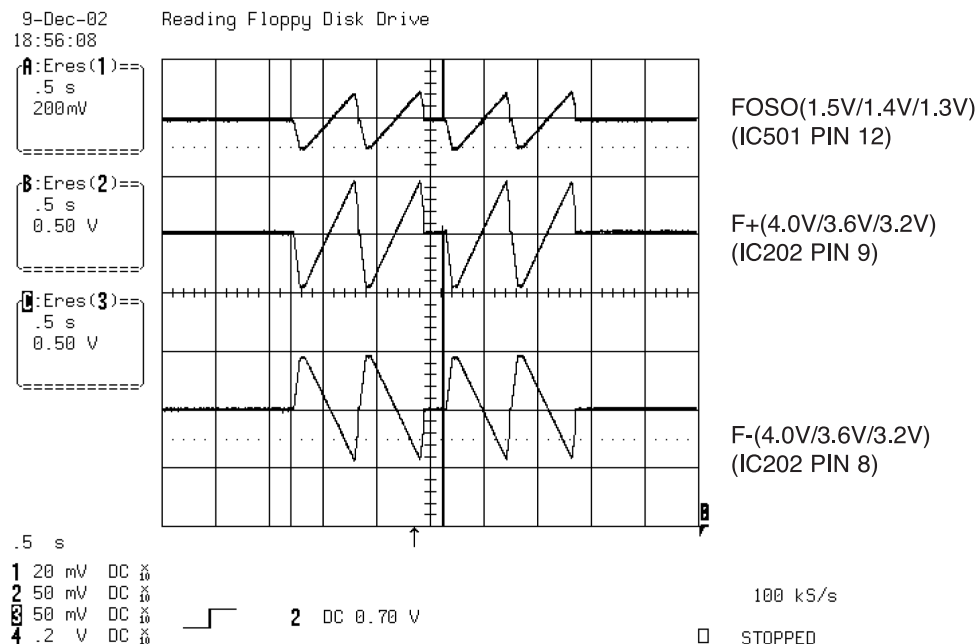


FIG 5-1

6. LASER POWER CONTROL RELATED SIGNAL (NO DISC CONDITION)

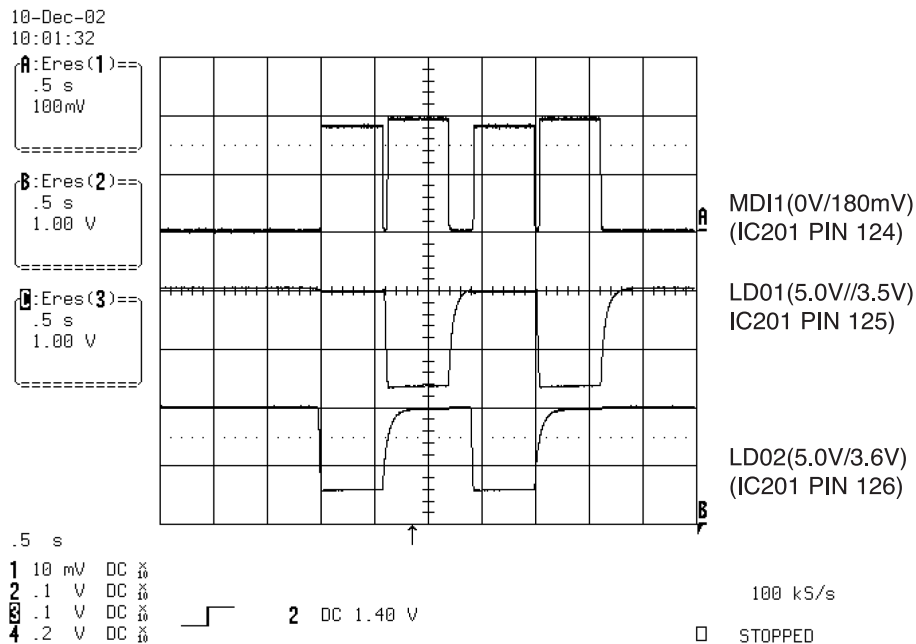


FIG 6-1

7. DISC TYPE JUDGEMENT W VEFORM

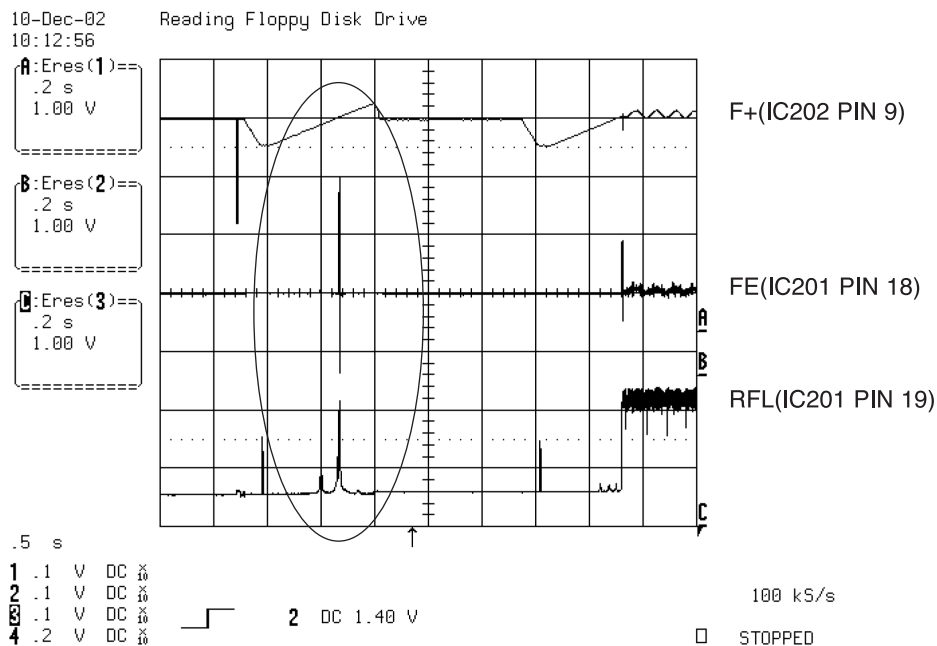


FIG 7-1 (DVD)

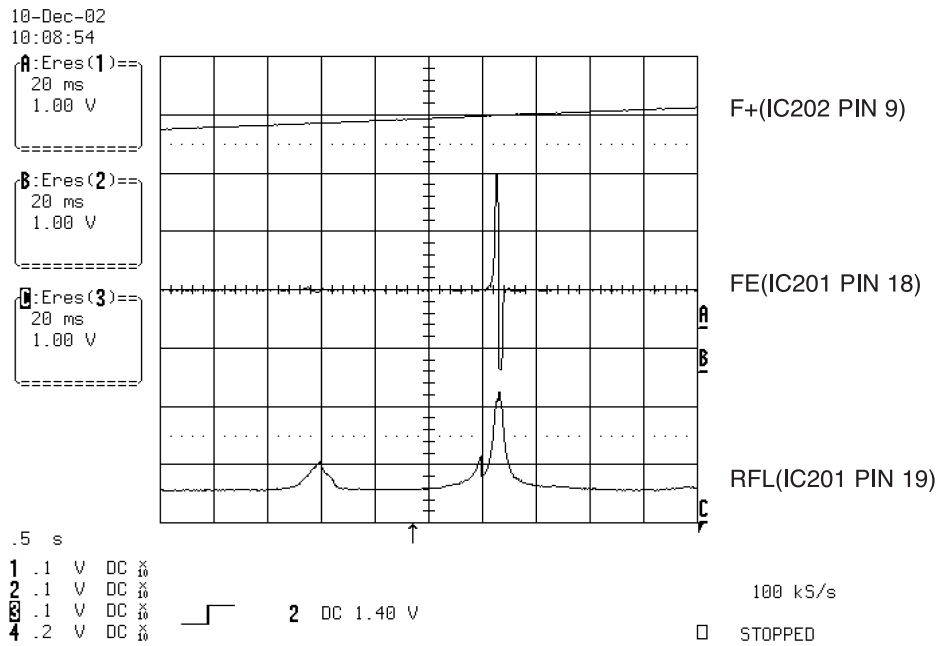


FIG 7-2 (DVD)

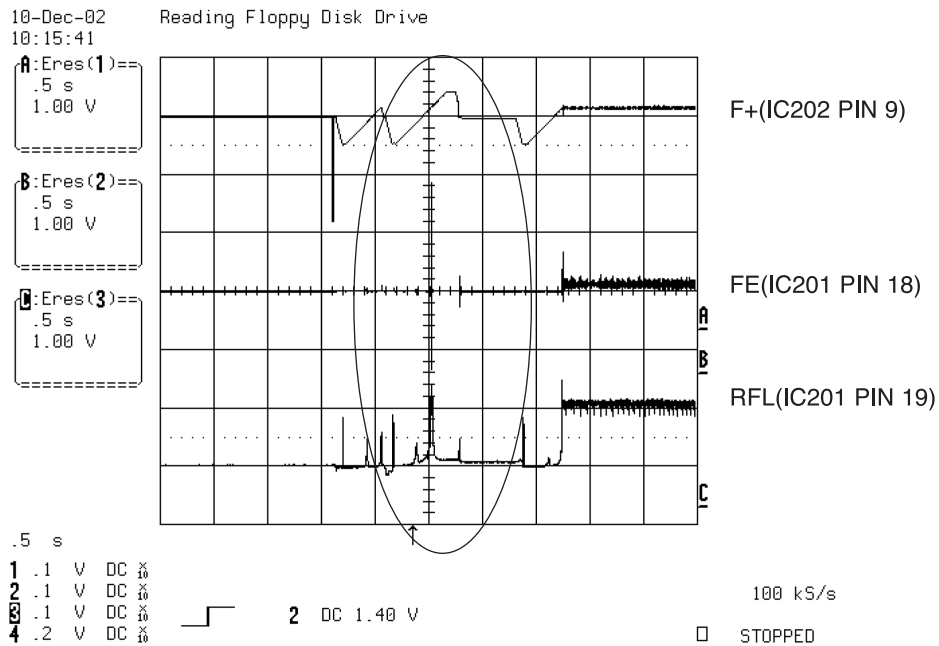


FIG 7-3 (CD)

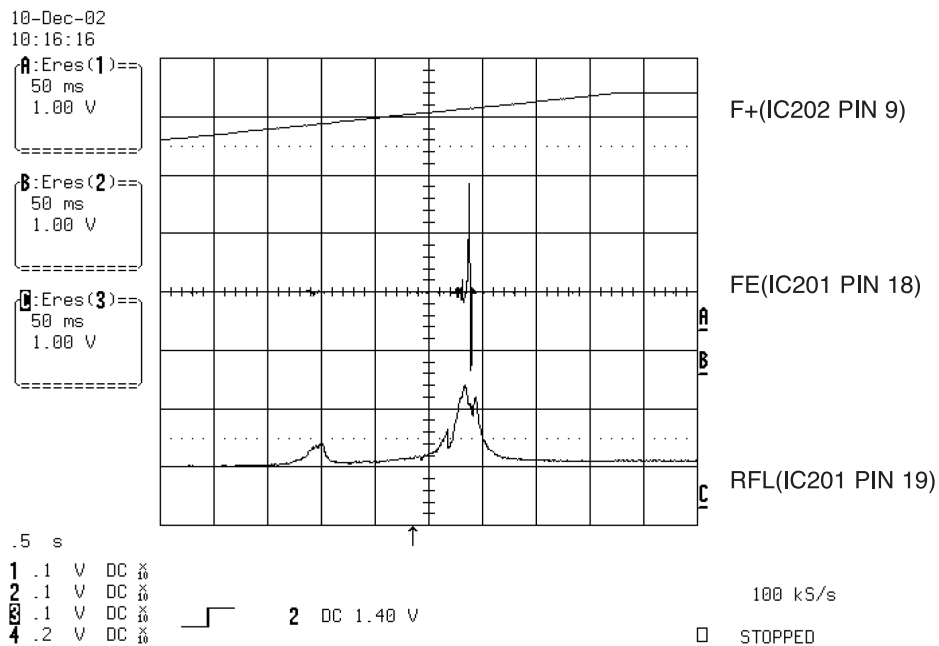


FIG 7-4 (CD)

8. FOCUS ON W VEFORM

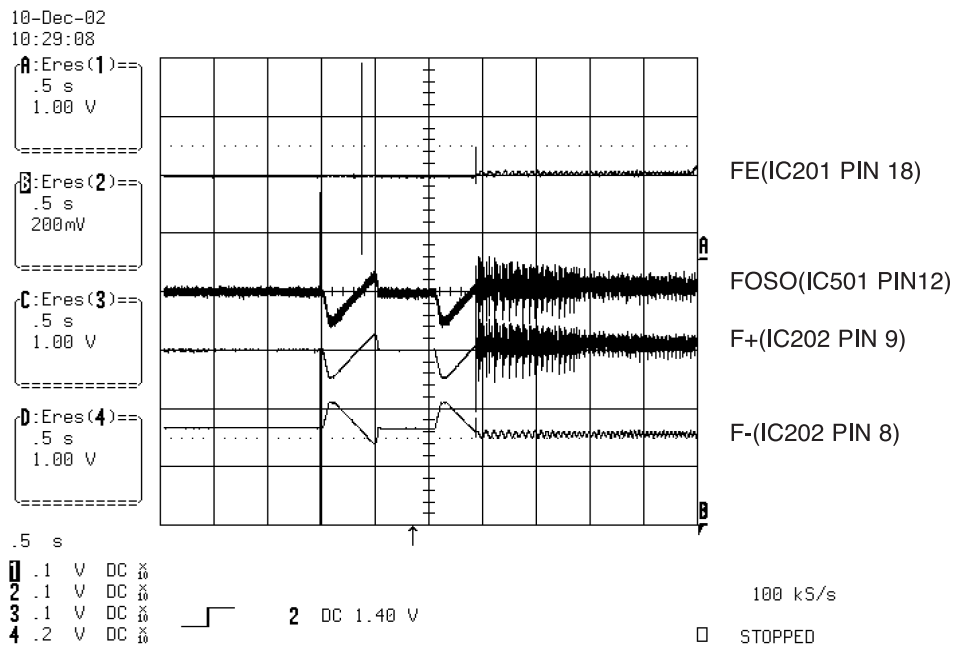


FIG 8-1 (DVD)

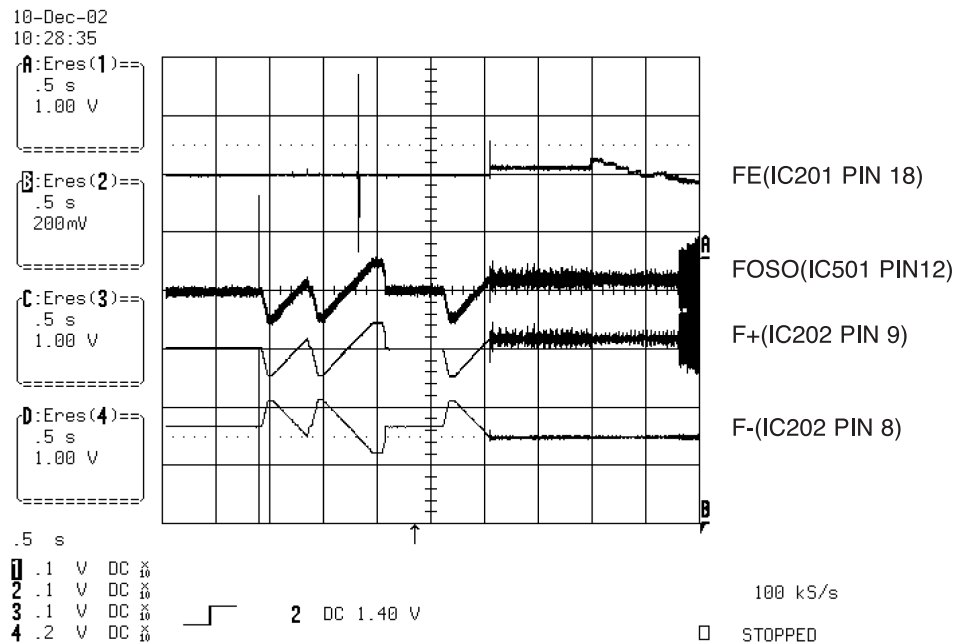


FIG 8-2 (CD)

9. SPINDLE CONTROL W VEFORM (NO DISC CONDITION)

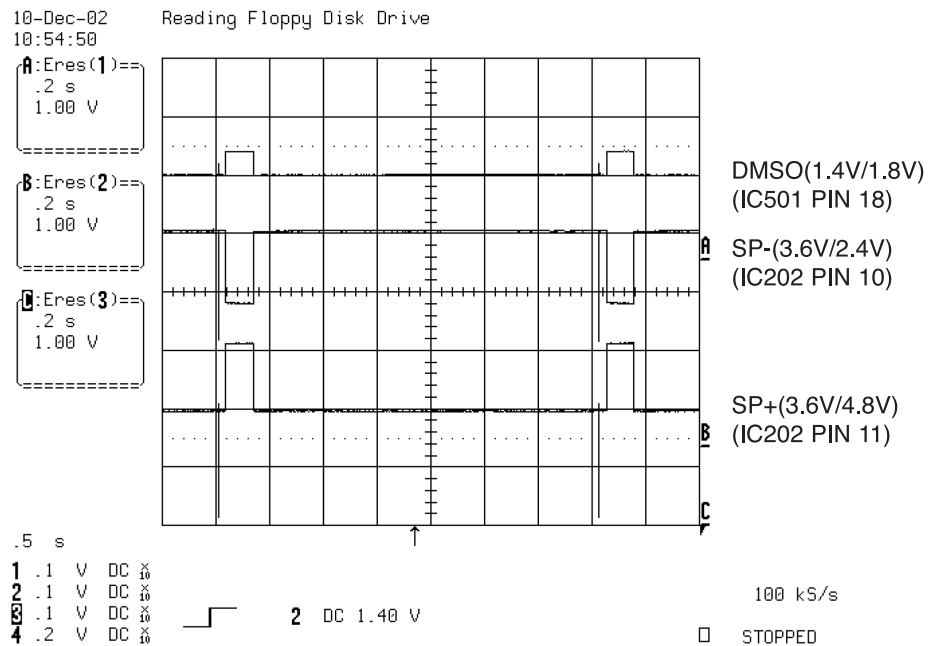


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

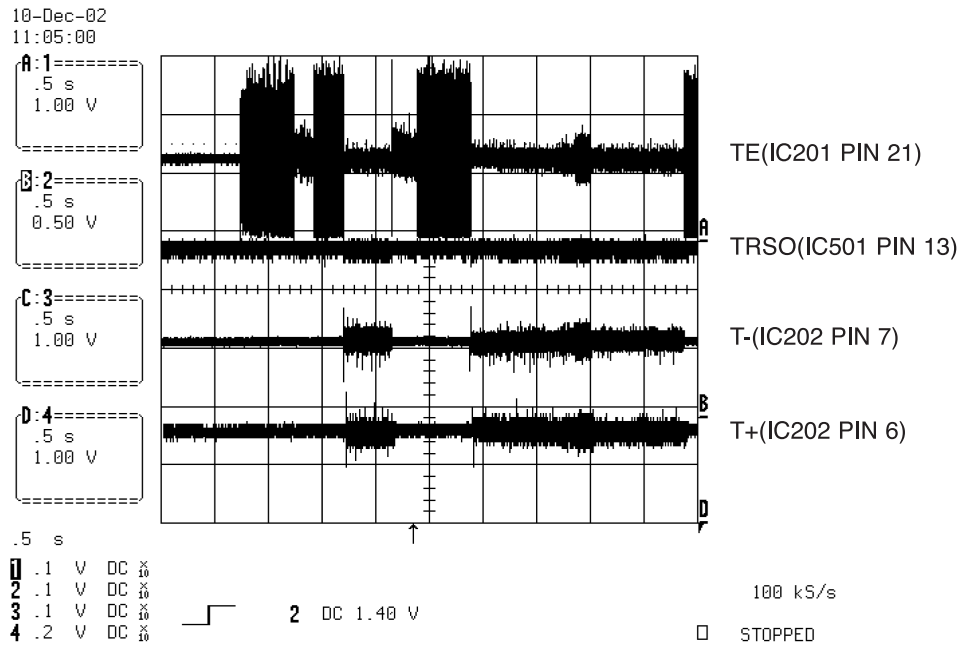


FIG 10-1(DVD)

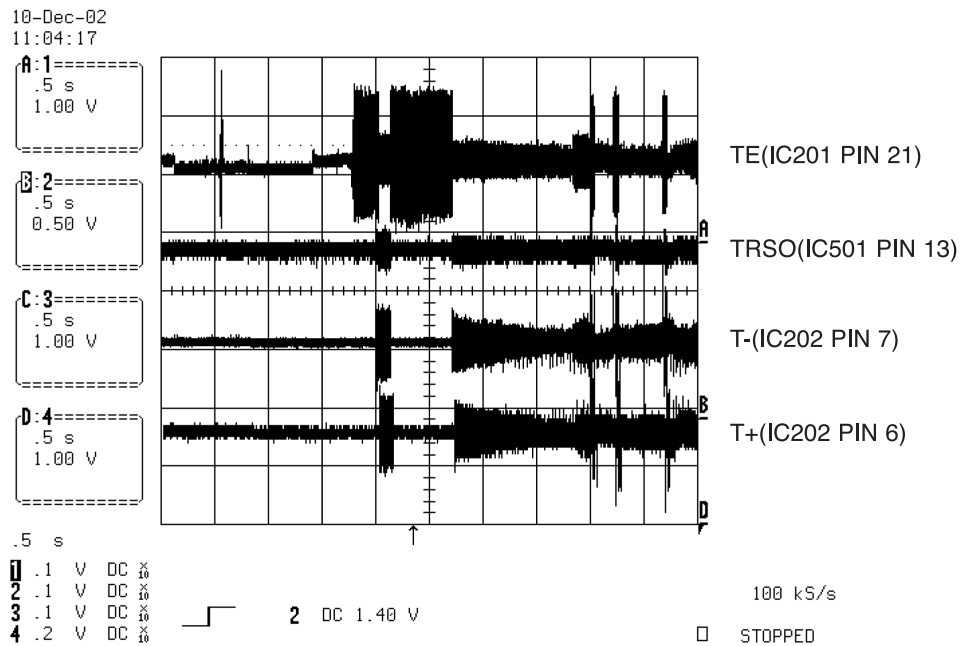


FIG 10-2(CD)

11. RF W VEFORM

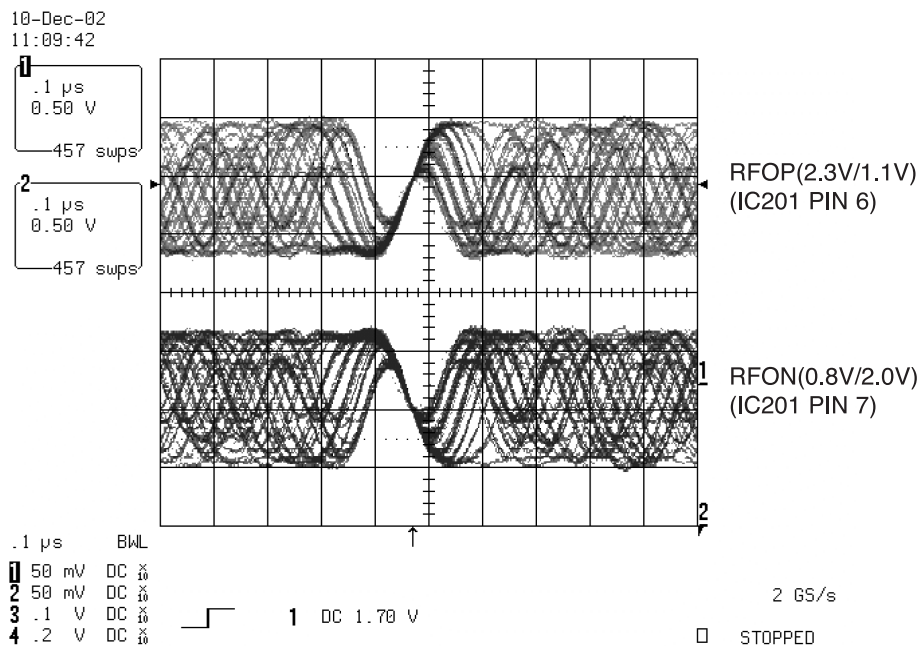


FIG 11-1

12. MT1379 AUDIO OPTICAL AND COAXIAL OUTPUT (ASPDIF)

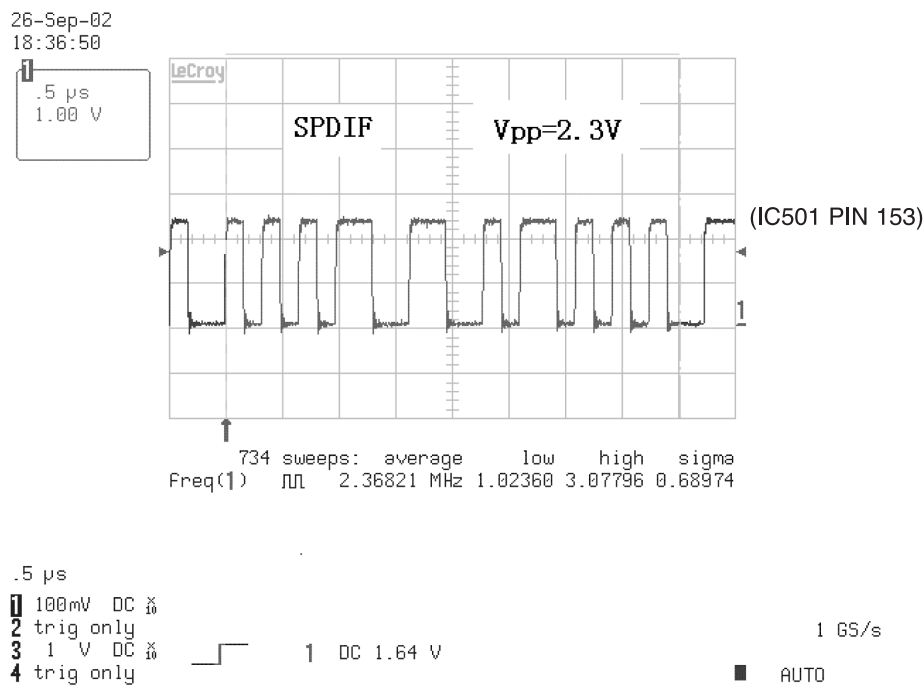


FIG 12-1

13. MT1379 VIDEO OUTPUT W VEFORM

1) Full colorbar signal(CVBS)

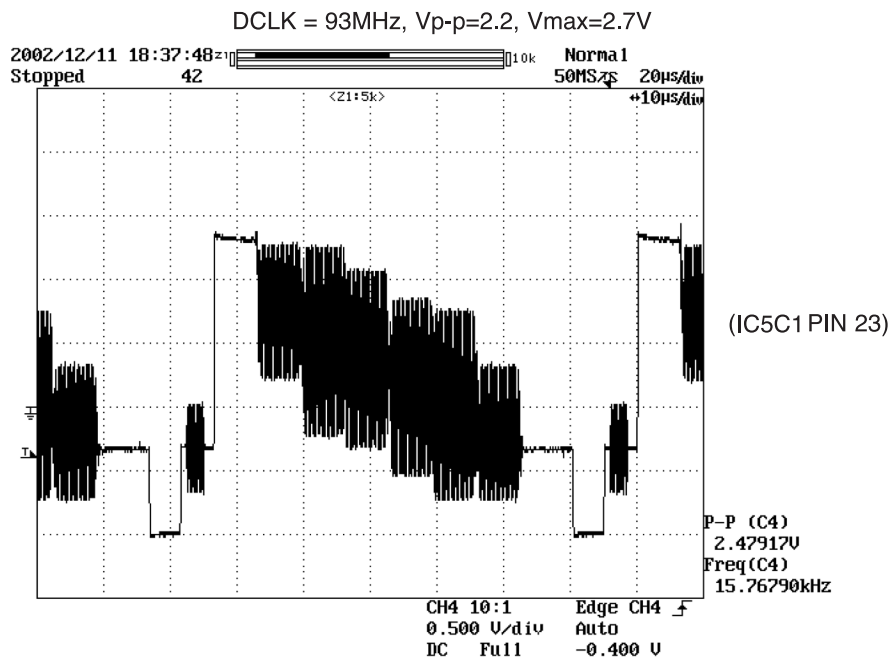


FIG 13-1

2) Y

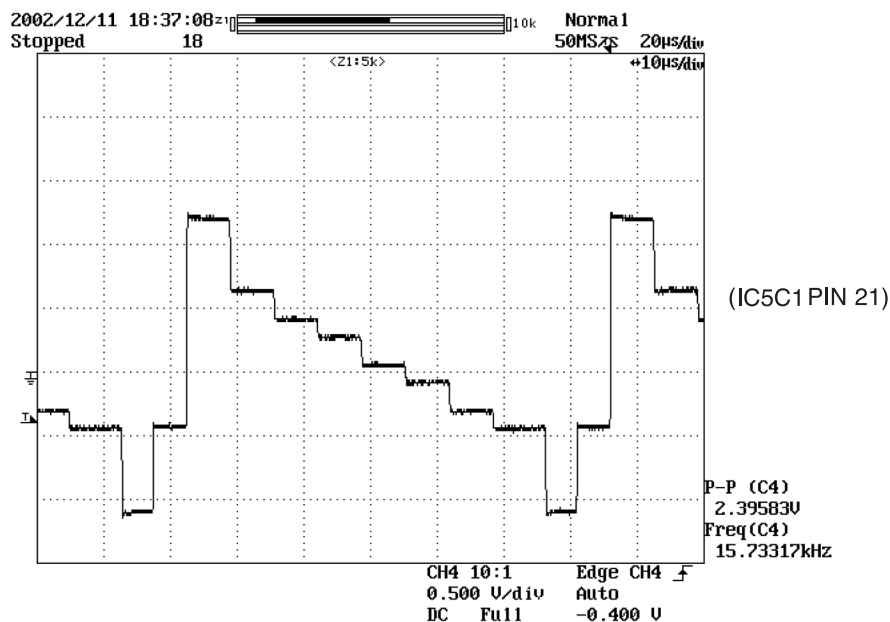


FIG 13-2

3) C

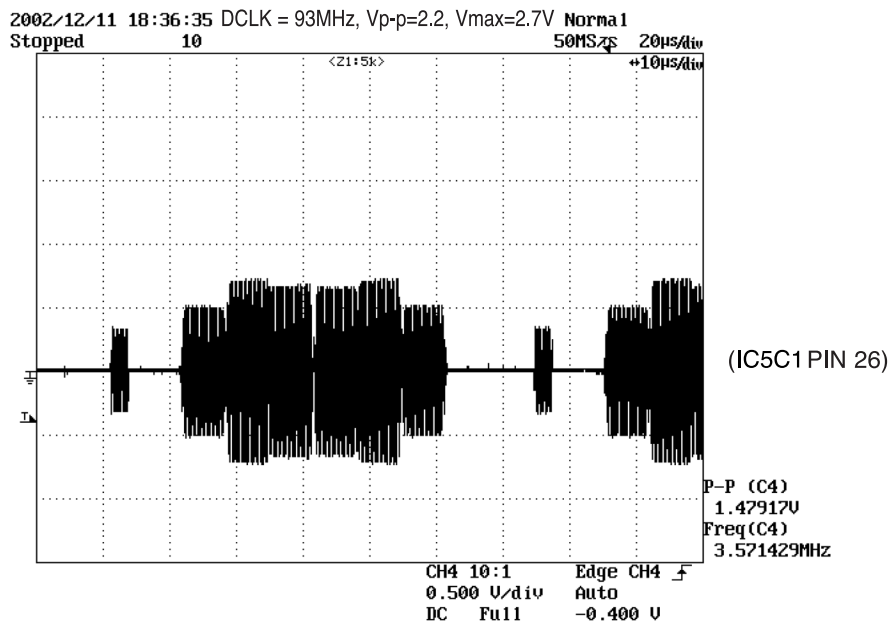


FIG 13-3

14. AUDIO OUTPUT FORM AUDIO DAC

1) Audio related Signal

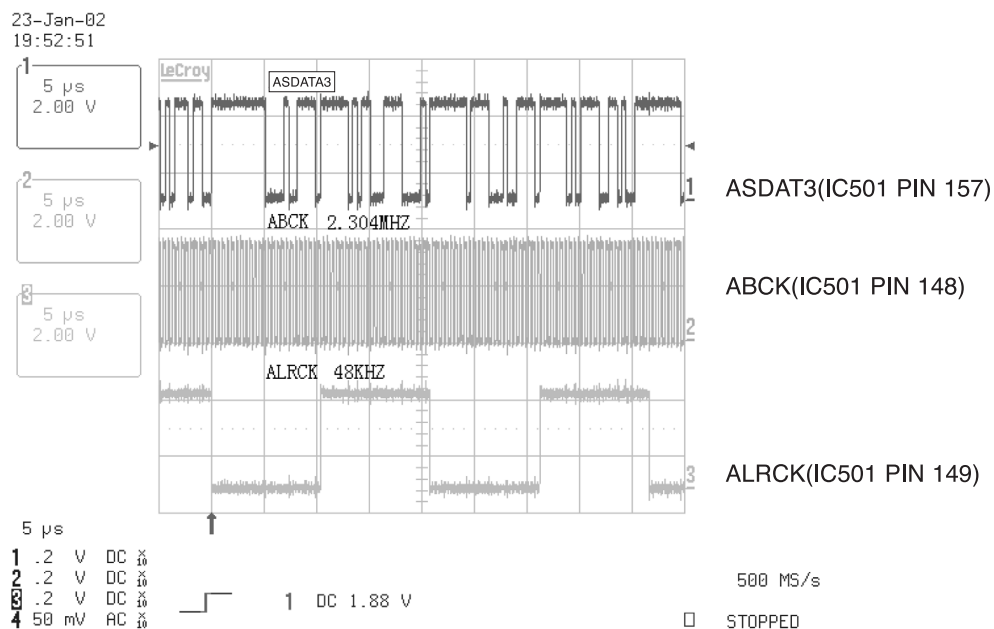
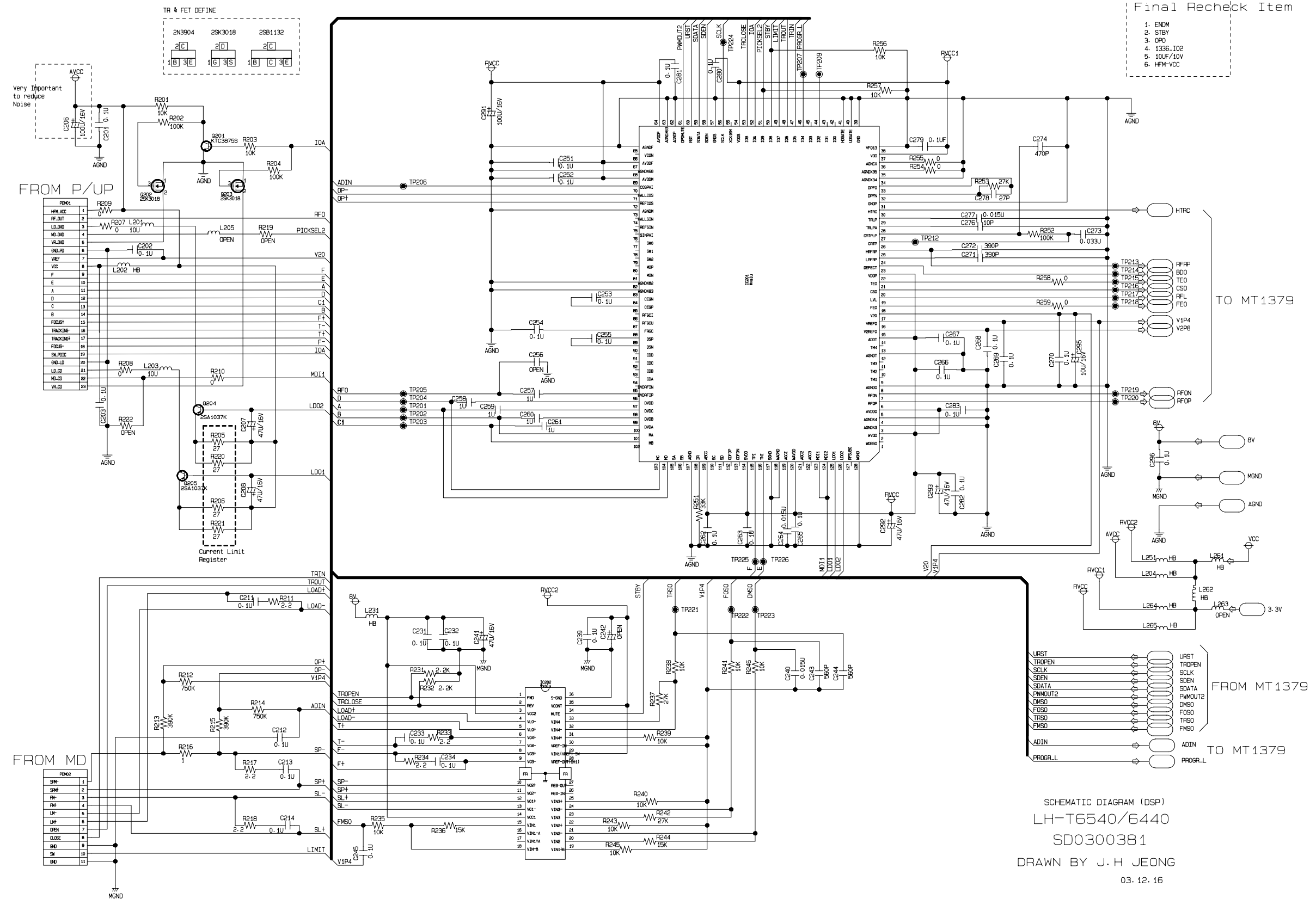


FIG 14-1

- **MPEG SCHEMATIC DIAGRAM**



- **SERVO SCHEMATIC DIAGRAM**



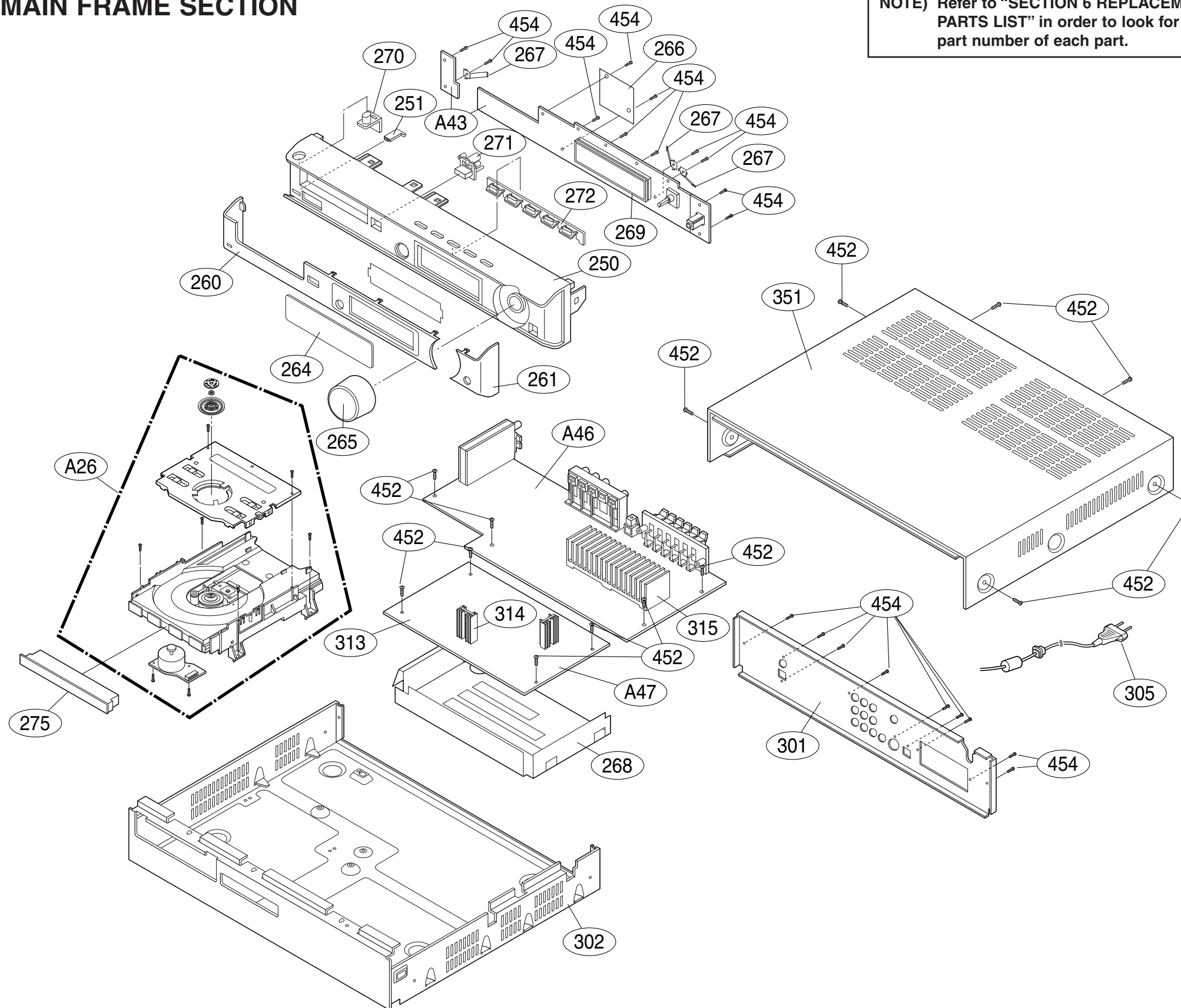
❑ VOLTAGE SHEET (IC&TR)

	IC201(MT1336E)			IC402(AMP)		IC5C1(MM1623XFBE)		IC501(MT1379)		IC506(SDRAM)		IC505(EEPROM)	
PIN	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	STOP	PLAY	
1	1.03	2.99	5.52	5.49	5.09	5.08	1.22	1.22	3.27	3.28	0	0	
2	5.11	5.08	5.52	5.48	2.43	2.42	0	0	1.18	1.26	0	0	
3	0	0	5.51	5.47	5.09	5.08	0.96	0.9	1.1	1.52	0	0	
4	0	0	0	0	1.45	0	2	2.06	0	0	0	0	
5	5.11	5.07	5.51	5.48	0	0	0	1.51	0.66	1.07	3.28	3.29	
6	0	1.95	5.51	5.48	1.45	1.69	1.48	1.47	0.85	1.12	3.28	3.29	
7	0	0	5.52	5.47	0	0	0	1.56	3.27	3.28	0	0	
8	0	0	12.03	12.03	2.47	2.46	3.2	1.52	0.51	0.97	3.28	3.29	
9	5.11	0			0	0	0.12	0.06	3.06	0			
10	5.11	5.08			1.14	1.76	0.12	0.06	0	0			
11	5.11	5.08			0	0	3.25	3.25	0.06	0.98			
12	0	0			2.42	2.42	1.41	1.49	3.18	0.87			
13	5.11	0			5.09	5.08	1.41	1.41	3.27	3.28			
14	5.11	5.08			2.43	2.42	0	0	2.94	2.56			
15	2.84	2.81			0	0	1.42	1.42	0.47	0.42			
16	1.45	1.43			2.49	2.47	3.3	0	2.93	3.01			
17	2.08	2.07			0	0	2.53	2.53	3.21	3.22			
18	1.37	1.42			2.48	2.47	1.42	2.27	2.87	2.95			
19	0.69	2.3			0	0	1.42	1.39	0.15	1.32			
20	2.4	0			1.18	2.3	0	0	0	0.05			
21	2.35	0			1.76	2.17	2.61	2.58	3.09	1.32			
22	5.11	5.08			0	0	0.75	1.46	3.09	1.32			
23	0	0			1.76	2.24	2.83	1	3.09	1.32			
24	2.59	3.2			0	0	1.9	0.89	3.09	1.33			
25	0.19	1.88			0	0	1.72	0.39	3.27	3.29			
26	1.58	0			0	0	0.68	0.31	0	0			
27	2.56	3.13			0.06	0.05	2.84	3.16	0.15	1.36			
28	2	2.01			5.09	0	0	0	1.84	2.36			
29	2	2.06					2.85	0.66	1	2.32			
30	2.96	1.52					1.83	0.49	0.54	1.75			
31	0	0					0.91	1.39	0.06	0.06			
32	0.06	2.07					1.43	1.2	0.05	0.06			
33	0.07	2.07					1.51	1.57	0	0			
34	0	0					1.51	1.43	0.73	1.26			
35	0	0					3.3	3.29	1.48	1.55			
36	0	0					0.81	1.26	2.91	2.53			
37	5.13	0					1.45	1.02	0.07	0			
38	0	0					1.82	1.6	3.27	3.28			
39	0	0					1.2	1.5	1.06	1.05			
40	0	0					2	2.06	0.47	0.98			
41	0	0					2.17	1.95	0	0			
42	5.12	5.09					2.53	2.52	0	0.6			
43	5.12	5.09					1.96	1.9	1.12	1.24			
44	5.12	5.09					1.79	1.9	3.27	3.28			
45	5.12	5.09					0.8	1.72	1.21	0.99			
46	5.12	5.09					0.8	1.96	1.31	1.34			
47	0	0					0.8	1.84	0	0			
48	5.12	5.09					3.3	2.63	1.43	1.44			
49	5.12	0					0	0.13	0.88	1.01			
50	5.08	5.06					0	0.07	0	0			
51	5.09	5.07					0	0					
52	5.1	0					0	0					
53	0	0					0	0					
54	5.13	0					0	0					
55	0.09	0.2					3.25	3.27					
56	1.61	0					1.21	1.18					
57	0	0					0	0					
58	0	0					3.29	3.29					
59	0	0					0	0					
60	0	0					0	0					
61	3.28	0					2.59	2.57					
62	0	0					2.58	2.58					
63	0	0					0	0					
64	0	0					2.59	2.56					
65	0	0					3.29	3.29					
66	0.26	0					3.3	3.29					
67	5.12	5.08					3.29	3.29					
68	0	0					2.57	2.56					
69	5.12	0					5.19	5.18					
70	3.21	2.03					2.59	2.57					
71	3.46	2.2					0.12	0.08					
72	2.81	0					2.53	2.52					
73	0	0					2.59	2.57					
74	0.21	0.09					3.29	3.29					
75	0.22	0					2.61	2.61					
76	0	0.1					3.27	3.24					
77	0.21	0.09					0	0					
78	0.23	0.09					0.94	1.04					
79	0.21	0.08					0.78	1.06					
80	0.23	0.08					0.89	1.15					

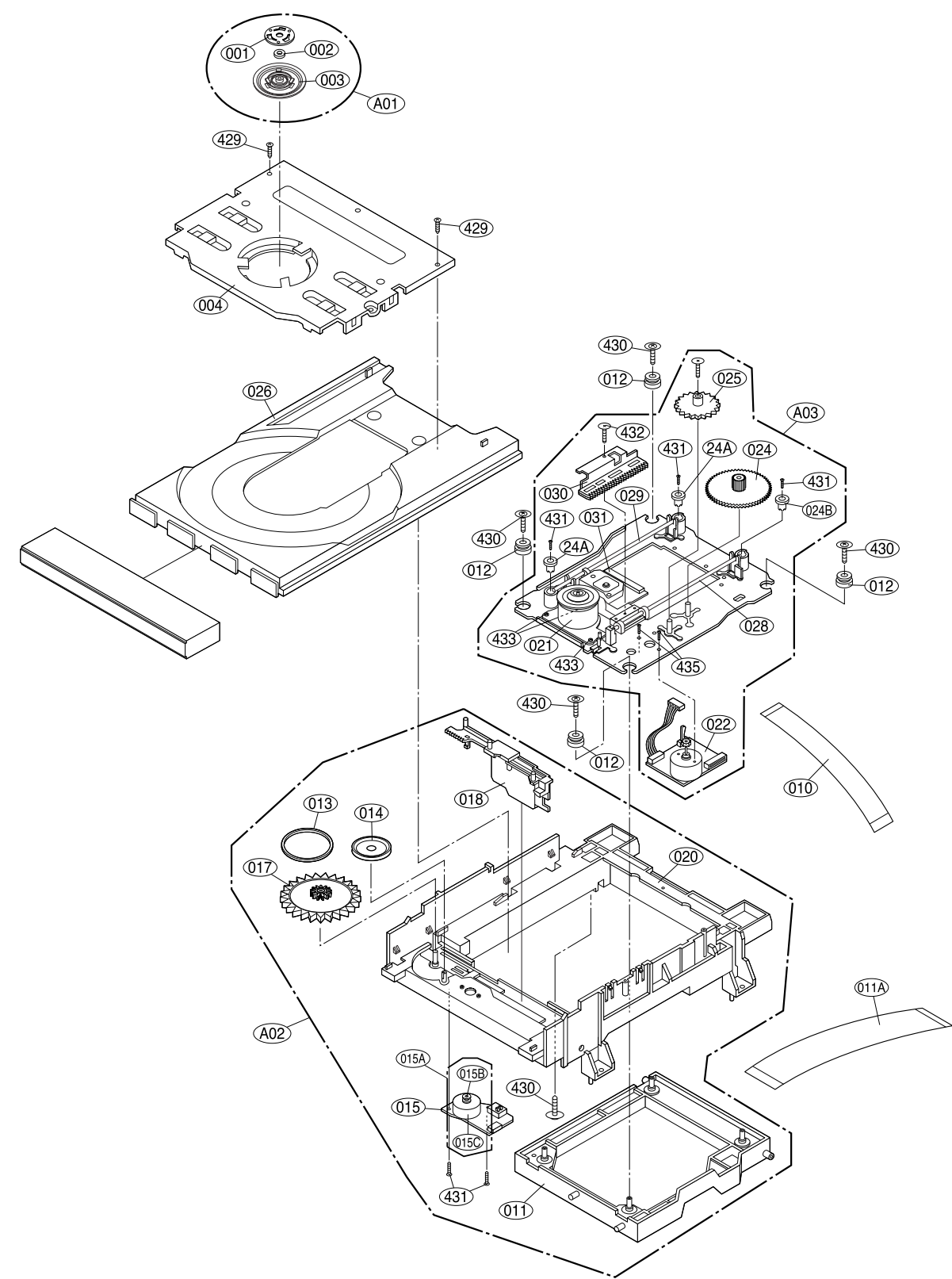
SECTION 4. EXPLODED VIEWS

• CABINET AND MAIN FRAME SECTION

NOTE) Refer to "SECTION 6 REPLACEMENT PARTS LIST" in order to look for the part number of each part.



• DECK MECHANISM EXPLODED VIEW

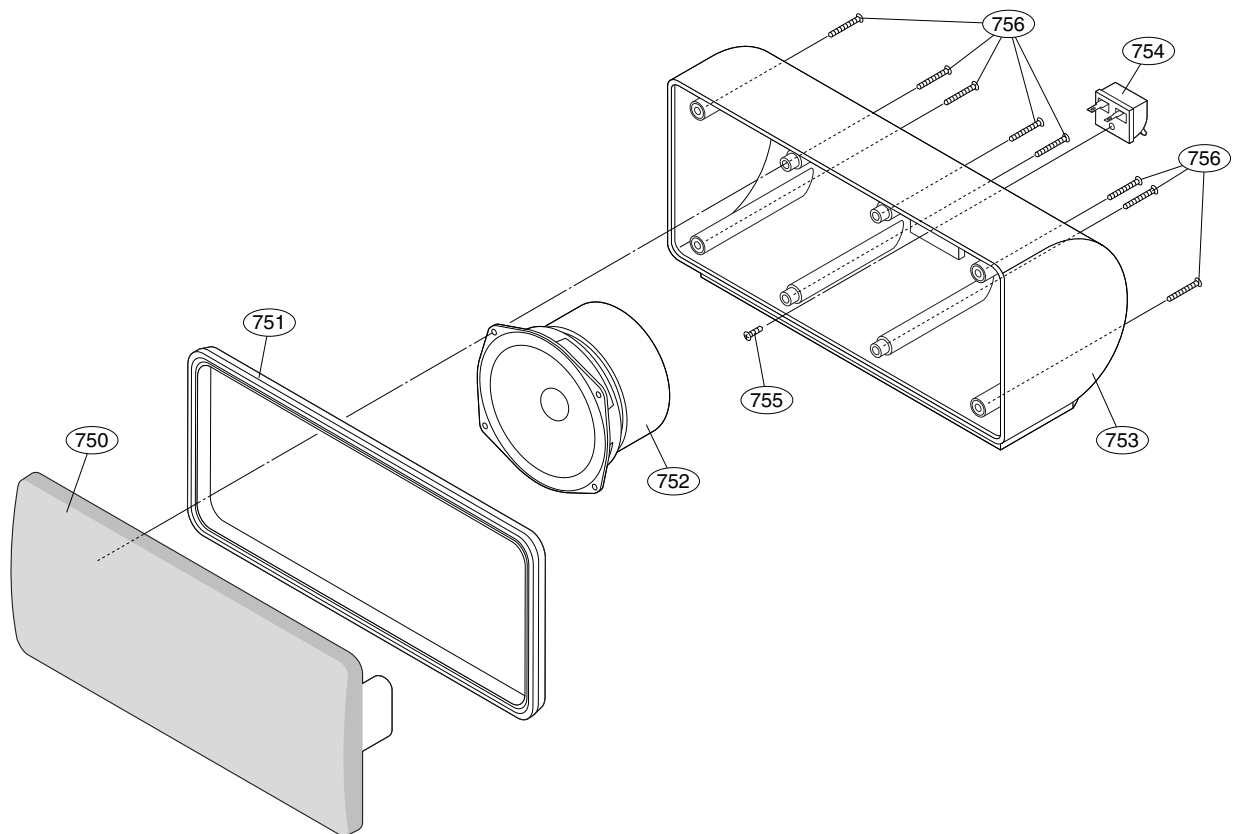


MEMO

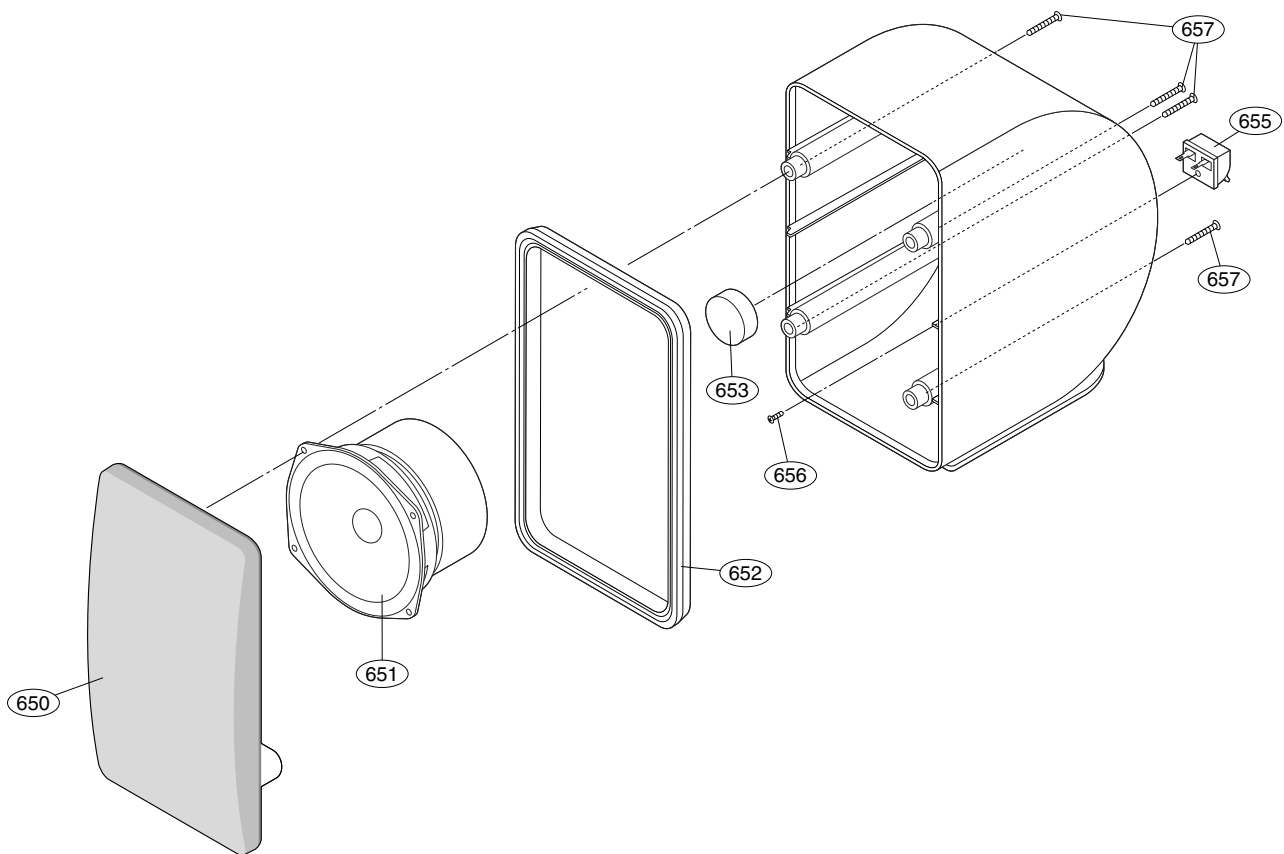
MEMO

SECTION 5. SPEAKER SECTION

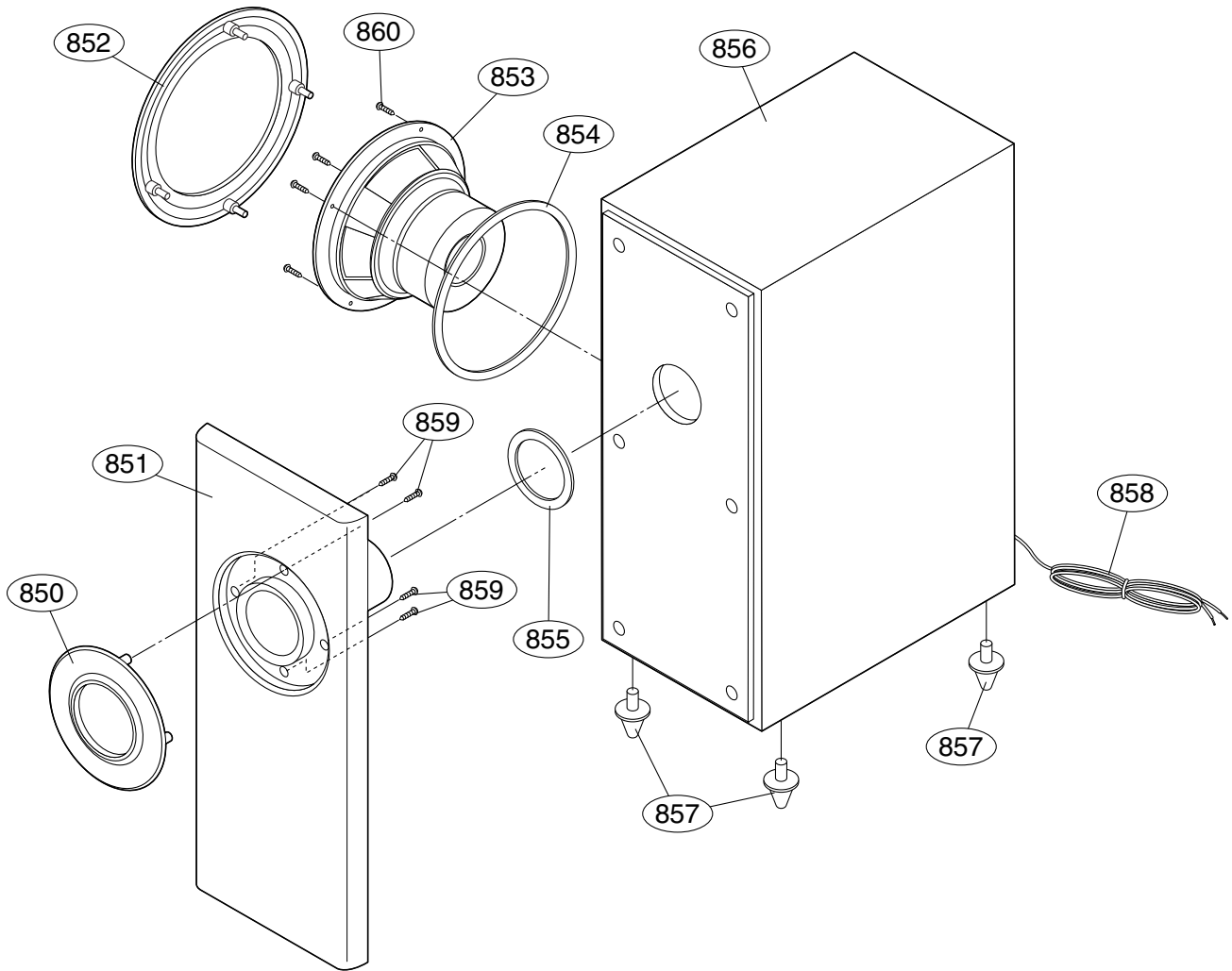
□ MODEL: LHS-T6440C



❑ **MODEL: LHS-T6440T**



❑ MODEL: LHS-T6440W



MEMO